

**Turbulent Arena:
Global Effects Against Non-State
Adversaries**

*Troy S. Thomas
William D. Casebeer*

INSS Occasional Paper 58

June 2005

USAF Institute for National Security Studies
USAF Academy, Colorado

Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JUN 2005		2. REPORT TYPE		3. DATES COVERED -	
4. TITLE AND SUBTITLE Turbulent Arena: Global Effects Against Non-State Adversaries			5a. CONTRACT NUMBER		
			5b. GRANT NUMBER		
			5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S)			5d. PROJECT NUMBER		
			5e. TASK NUMBER		
			5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) USAF Institute for National Security Studies,USAF/DFES,2354 Fairchild Dr Ste 5L27,USAF Academy,CO,80840			8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSOR/MONITOR'S ACRONYM(S)		
			11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES The original document contains color images.					
14. ABSTRACT see report					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES 74	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

The views expressed in this paper are those of the authors and do not necessarily reflect the official policy or position of the Department of the Air Force, the Department of Defense, or the US Government. The paper is approved for public release; distribution is unlimited.

ABOUT THE AUTHORS:

Troy S. Thomas is an Air Force officer assigned to the Joint Chiefs of Staff. In addition to leading airmen in homeland defense missions and combat operations in the Middle East, Troy served as intelligence flight commander for the 1st Fighter Wing, a war planner in South Korea, an Assistant Professor of Political Science at the US Air Force Academy, and a Fellow with the Center for Strategic Intelligence Research. A distinguished graduate from the Air Force Academy, he holds a MA in Government from the University of Texas, Austin, a MA in Organizational Management from George Washington University, and a MA in Operational Studies from the USMC School of Advanced Warfighting. Troy is a term member with the Council on Foreign Relations, a member of the Council for Emerging National Security Affairs, and Associate with the Institute for National Security Studies. Travel to over 38 countries informs his publications on leadership, conflict, intelligence, and Islam.

William D. Casebeer, Major, USAF, has served as an intelligence officer and Middle East political and military analyst, and as an Assistant Professor in the Department of Philosophy at the Air Force Academy. He is a graduate of the US Air Force Academy, where he majored in political science. He completed an M.A. in Philosophy at the University of Arizona and taught in the Philosophy Department at USAFA for two years prior to returning to graduate school, where he completed a Ph.D. in Cognitive Science and Philosophy at the University of California at San Diego. His book *Natural Ethical Facts: Evolution, Connectionism, and Moral Cognition* was published by MIT Press in 2003. Maj Casebeer is currently attending Intermediate Developmental Education at the Naval Postgraduate School. He has teamed with Troy Thomas and Stephen Kiser for the forthcoming *Warlords Rising: Coping with Violent Non-State Actors* (Lexington, 2005).

Comments pertaining to this paper are invited; please forward to:
Director, USAF Institute for National Security Studies
HQ USAFA/DFES
2354 Fairchild Drive, Suite 5L27
USAF Academy, CO 80840
phone: 719-333-2717
fax: 719-333-2716
email: inss@usafa.af.mil

Visit the Institute for National Security Studies home page at
<http://www.usafa.af.mil/inss>

TABLE OF CONTENTS

Foreword	vii
Executive Summary	ix
Introduction	1
Organic Threats	4
VNSA as Open Systems	5
Contributing Concepts	10
Slicing the Environment	14
Battlespace Effects	21
Defining Effects	21
Net Effects	25
Dimensional Effects	37
Battlespace Shaping	46
Battlespace Manipulation	47
Parting Shots	55
Notes	57

FOREWORD

We are pleased to publish this fifty-eighth volume in the *Occasional Paper* series of the United States Air Force Institute for National Security Studies (INSS). This volume continues a seminal series of reports by the research team of Troy Thomas, Bill Casebeer, and Steve Kiser. The series (Troy Thomas and Stephen Kiser's *Lords of the Silk Route*, Occasional Paper #43, May 2002; and Troy Thomas and William Casebeer's *Violent Systems*, Occasional Paper #52, March 2004) began by establishing a systematic framework for the analysis of the broad category of violent non-state actors (VNSA), and by applying that framework broadly for deterring and combating such groups. The series was supplemented by *Armed Groups* (Occasional Paper 57, September 2004) in which Dick Shultz, Doug Farah, and Itamara Lochard added differentiation and analysis of four distinct categories of VNSA. The current work summarizes much of that earlier work in establishing a context specifically for planning and conducting effects based counter-VNSA activities. This framework has broad applicability to much of the current military activity being undertaken by the United States around the world, and it is developing into a critical foundational framework for military intelligence, planning, and operations. We most highly commend this work to all who are interested in understanding the current security environment facing the United States, and we strongly recommend it as must reading to US military analysts, planners, and commanders.

About the Institute

INSS is primarily sponsored by the Strategic Security Directorate, Headquarters US Air Force (HQ USAF/XOS), and the Dean of the Faculty, USAF Academy. Other sponsors include the Secretary of Defense's Office of Net Assessment (OSD/NA); the Defense Threat Reduction Agency (DTRA); the Air Force Information Warfare Center (AFIWC); The Army Foreign Military Studies Office (FMSO); the Army Environmental Policy Institute (AEPI); the United States Northern Command/North American Aerospace Defense Command (NORTHCOM/NORAD); and the United States Military Academy Combating Terrorism Center (CTC). The mission of the Institute is "to promote national security research for the Department of Defense within the military academic community, to foster the development of strategic

perspective within the United States Armed Forces, and to support national security discourse through outreach and education.” Its research focuses on the areas of greatest interest to our organizational sponsors: arms control and strategic security, counterproliferation and force protection, homeland defense and combating terrorism, regional and emerging national security issues, air and space issues and planning, and information operations and warfare.

INSS coordinates and focuses outside thinking in various disciplines and across the military services to develop new ideas for defense policy making. To that end, the Institute develops topics, selects researchers from within the military academic community, and administers sponsored research. It reaches out to and partners with education and research organizations across and beyond the military academic community to bring broad focus to issues of national security interest. And it hosts conferences and workshops and facilitates the dissemination of information to a wide range of private and government organizations. In these ways, INSS facilitates valuable, cost-effective research to meet the needs of our sponsors. We appreciate your continued interest in INSS and our research products.

JAMES M. SMITH
Director

EXECUTIVE SUMMARY

Violent non-state actors (VNSA) pose a pressing challenge to human and national security across the geo-political landscape. In the midst of a global war against terrorism, collective violent action thrives as a strategy of groups ranging from the al Qaida network to Maoist rebels of Nepal to the Revolutionary Armed Forces of Colombia (FARC). The dark dynamics of globalization enable VNSAs to prosper in a turbulent international environment marked by deepening roots of violence, failures in governance, and burgeoning illicit trade in guns, drugs and humans. With few exceptions, VNSAs play a prominent, often destabilizing role in nearly every humanitarian and political crisis faced by the international community. Successfully countering VNSAs across the geo-political landscape is complicated by a host of factors, including the adaptive character of the threat and the difficulty of developing and implementing a coherent strategy that engenders measurable victories.

By applying systems analysis to this intensifying problem, we first proffer an actionable and universal analytical framework for diagnosing the non-state adversary. Building on previous research into the operational environment and VNSA properties, we now expose the internal workings of the organization in order to understand sources of strength and critical vulnerabilities. This sets up a counter-VNSA (C-VNSA) strategy that goes beyond coercion to the defeat of the enemy. At its core, our C-VNSA strategy defeats a VNSA by: 1) denying the negative entropy, or stores of energy, required to survive attack; and 2) disrupting congruence, or fit, among sub-systems to achieve system failure. By also understanding the indicators of organizational change during its developmental life-cycle, preemptory defeat before the VNSA reaches maturity becomes feasible. Importantly, our approach allows for measuring campaign progress by assessing changes in VNSA effectiveness. Thus armed, prospects improve for inter- and intra-governmental collaboration, on-target intelligence collection and analysis, and successful execution of a multi-faceted, effects-based strategy.

**TURBULENT ARENA:
GLOBAL EFFECTS AGAINST NON-STATE
ADVERSARIES**

Hidden down a narrow alley in the old quarter, or Parte Vieja, of San Sebastian in the Basque province of Spain is one of many small bars. It is crammed with young people wearing t-shirts championing Basque nationalism and chain smoking under a large poster of Che Guevara. The bar, and probably most of its crowd, is loosely associated with the recently banned Herri Batasuna (Popular Unity) political party, which was linked in its 1979 origins with the terrorist organization ETA (Basque Homeland (Euskadi) and Freedom). Among these youth, several if not many, will spend the early hours before daybreak spray painting “ETA” and other nationalist slogans across the old city—a ritual being simultaneously conducted in the province’s other major urban centers of Vitoria and Bilbao. From among these rebellious youth, several will one day be approached by ETA recruiters, and if selected, their participation in vandalism will cease while their indoctrination and training in terrorism will begin. According to officials of the Basque Nationalist Party, recruitment is becoming more difficult for ETA. Improved economic conditions as well as the increased societal rejection of violence have reduced the pool of potential recruits, forcing ETA to consider less than optimal new members or face dwindling numbers. For those that make the cut, as members of an organization that has killed 800+ since its founding in 1959, they may be called on to assassinate Spanish officials or place improvised explosive devices on trains—attempts to do this on up to four trains headed for Madrid in December 2003 failed. Given the arrests of key ETA leaders over the decades, and most recently in France in 2002 with the arrest of ETA’s commandos leader, Jon Ibon Fernandez, the rebellious youth of the back alley bar may even rise to the rank of senior military leader within a matter of years.¹

Whether ETA survives or dies depends on its ability to adapt to increased environmental turbulence. Among the many dimensions of turbulence that violent non-state actors (VNSA) encounter, ETA in particular confronts increased international law enforcement

Thomas and Casebeer—Turbulent Arena

cooperation, political marginalization due to the socio-economic prosperity of the Basque region, and a public backlash against terrorist methods due to the Madrid bombings on 11 March 2004 by religious extremists. Just as VNSA like ETA attempt to prosper in a turbulent environment, the United States (US) and other stakeholders must navigate a messy security landscape to successfully engage, prevent, and defeat non-state adversaries. The contest between nation-states and VNSA takes place in an environment that is marked by an unprecedented degree of complexity and diversity. On one hand, the revolution in information technology enables a global recruiting campaign by religious extremists, while on the other, persistent socio-economic deprivation and failures in governance expand the recruiting pool. Single-country groups access transnational networks, and groups with global reach penetrate the dense physical terrain of mega-cities where governments fear to tread. It is in this demanding environment, buffeted by the forces of globalization and extremism that we seek to deter, coerce, and defeat non-state adversaries.

Typically, we approach this contest in terms of a direct relationship between the belligerents, each seeking to directly affect the other through policies and violent action. In reality, the interaction is filtered and modified by the environment. Moreover, the environment generates its own effects. For example, the diffusion of technology allows a bin Laden speech to shape terrorist targeting strategy in Iraq, reconstruction efforts in an Afghanistan village enables access to fresh intelligence on the location of weapons stores, and heavy February rains complicate monitoring airborne drug trafficking in the Andean region.² As these examples suggest, the contest with VNSA occurs within a dynamic arena that affords constraints and opportunities that are irrespective of organizational behaviors. Gaining an advantage in

this contest requires an understanding of what the environment allows and discovering ways to shape the environment in a manner that influence VNSA performance and prosperity. When awareness of opportunities for environmental leverage is combined with insight to adversary vulnerabilities, the result is an asymmetric knowledge and capability advantage.

The intent of this paper is to generate an understanding of the environment in order to shape it to the detriment of our non-state adversaries and to our operational advantage. We seek to build on strategies that target the adversary organization directly by developing a framework and associated methods for affecting adversary performance indirectly through environmental manipulation. We begin with an examination of VNSA as organic threats. As open systems, VNSA and all other organizations are influenced by forces outside their social boundary. The open systems methodology is a universal framework for a global problem set. As a transportable tool, it allows for structured analysis across regions, which is increasingly important given the transnational character of VNSA. Moreover, we review contributing concepts from previous research to show how VNSA interact with the environment through boundary-spanning functions and change in form and function over the course of their life cycles. Thus armed, we debut a framework for defining the environment in terms of a contested battlespace. More directly, we elevate the importance of the information and social dimensions as critical arenas for analysis and action. Next, we define the core concept of effects, distinguishing between direct, indirect, cascading, and cumulative effects. Reversing the conventional cause-effect arrow, we introduce methods for evaluating the overall character of the battlespace to determine how its effect—degrees of uncertainty, webs of influence, resource

dependencies, and affordances—shape organizational behavior. Following this examination of net effects, we outline effects that radiate from the physical, information, and social dimensions. Among other firsts, we attempt to operationalize cultural intelligence and address cognitive effects. Equipped with the framework, concepts, and methods for thinking about battlespace effects, we close with several general guidelines for improving the environmental shaping component of a counter-VNSA strategy.

ORGANIC THREATS

VNSA are non-state organizations that use collective violence.³ VNSA embrace a broad spectrum of political goals, ranging from statehood for ethnic separatists to the establishment of a religious political order by extremists. They leverage the dark dynamics of globalization to move in the shadows of the nation-state, exploiting seams to transit the terrain of the physical, information and social dimensions. They embrace asymmetric values and methods to erode sovereignty, propagate an ideology, and in many cases, annihilate a perceived adversary. VNSA propagate a multi-faceted, global enterprise where violence is no longer the only product, and in fact, it may not be the most important to group survival. In addition to upholding the time-honored tradition of blowing things up, VNSA now run clinics and schools, produce and ship drugs, operate charities, and host game shows. Knowing our adversary is proving increasingly difficult. We are in need of a conceptual model with associated methods for understanding and, ultimately, influencing the wide range of VNSA that populate the modern security landscape.

There is growing recognition of the value in treating all organizations, including VNSA, as open systems, interacting with a dynamic environment. Approaching organizations as open systems is

not new to the social sciences; however, the application of systems thinking to violent groups, including terrorists, insurgents, and transnational criminal organizations is. The open systems framework that we develop and apply here is guided by modern organization theory, which is rooted in an interdisciplinary approach to the examination of social groups. As a way of thinking about organizations of all types, organization theory has evolved beyond a rigid emphasis on scientific management and bureaucratic structures, which characterize mechanistic organizations, to an organic view based on natural and biological systems.⁴ That is, structural theory does not reveal the inner workings of the organizations to include the complex informal interactions that constitute the “real” group. Our analysis must go beyond formal structural theory to appreciate these complexities as an aspect of the dynamic, even organic character of all social organizations.

VNSA as Open Systems

Open systems theory serves as the diagnostic framework for our inter-disciplinary analysis of VNSA. As applied in modern organization theory, diagnosis is the process of employing conceptual models and methods to assess a target organization’s condition in order to solve problems and increase performance.⁵ We diagnose VNSA for a different, but related purpose: to assess the capabilities of threatening organizations in order to decrease and deny their performance. Our diagnosis is framed by open systems theory; meaning it is directed by an open systems-informed theoretical framework, which is less deterministic than a theory, but still allows for analysis of key concepts and the relationships among them.⁶

The open systems framework springs from the general systems theory of Ludwig von Bertalanffy in the 1940s, but it did not catch hold

Thomas and Casebeer—Turbulent Arena

in the social sciences until the 1960s and 1970s. Championed by Daniel Katz and Robert Kahn in their seminal work, *The Social Psychology of Organizations*, and many others, open systems theory emerged as modern organization theory by the 1980s, replacing the more limiting structural approach. Among its many early benefits, the “adoption of a systems frame helped researchers in the social sciences to discover commonalities with fields such as biology and engineering, and it provided a basis for an interdisciplinary approach to organizations.”⁷ After over sixty years of applied and basic research, open systems theory has emerged as the principal approach to understanding organizations.

At its most basic, open systems theory views all organizations as *systems*, interacting with their environment in a dynamic manner. In the words of its godfather von Bertalanffy, it conceptualizes a system as an “organized cohesive complex of elements standing in interaction.”⁸ The interaction refers to two generalized patterns of behavior that must keep our attention throughout: (1) the relationship between the VNSA system and its environment; and (2) the relationships among the “complex elements,” or parts of the organization (known as subsystems). The latter constitute the transformational processes of the VNSA, while the former draws attention to the reality that organizations are open systems, continually exchanging information and energy with the environment.

Too often organizations are analyzed in isolation from their environment with excess emphasis on internal structures, including organization charts, leadership, rules, formal communications and process efficiency to name a few. While a useful aspect of organizational diagnosis, this *closed system* approach neglects the simple reality that an organization “must interact with the environment

to survive; it both consumes resources and exports resources to the environment.”⁹ As put by Katz and Kahn, “living systems, whether biological organisms or social organizations, are acutely dependent upon their external environment.”¹⁰ The VNSA emerges as a response to environmental pressures, and it is in turn affected by contextual constraints and opportunities—the arena of cause-effect interaction is the focus of this paper. Thus, our approach lends itself more to an inter-disciplinary application based on ecology, engineering, and social science than it does to the Newtonian physics of closed systems.

It is an understatement to say that open systems are highly complex. As put by noted organizational theorist and practitioner, Richard Daft, “the organization has to find and obtain needed resources, interpret and act on environmental changes, dispose of outputs, and control and coordinate internal activities in the face of environmental disturbances and uncertainty.”¹¹ To simplify, which is essential to ensuring our diagnostic framework is applicable on the street, all organizational systems share the following basic components: (1) importation of energy and resources; 2) through-put (transformation of this energy and these resources); 3) export of product to the environment; and 4) dynamic pattern of activities. Organizational inputs are many, but generally include the raw materials, money, people, equipment, and information.¹² Outputs can be objective and subjective, but generally include products, services, ideas, and in the case of VNSA, collective violence. The transformations—the ways it converts inputs into outputs—are often the most difficult to diagnose, particularly given the elusive character of VNSA. Finally, all relationships inside and outside the system are dynamic; they involve feedback based on interactions with the environment. As put by Katz and Kahn, “Inputs are also informative in character and furnish signals

to the structure about the environment and about its own functioning in relation to the environment.”¹³

An initial look inside the organization reveals a dizzying array of activities and behaviors whose overall contribution to system performance seem beyond determination. Systems theory comes to the rescue by structuring these activities for us. Patterns of activity in all organizations are both formal and informal, and they reflect the most basic level of analysis. By examining how people interact with information and tools to accomplish tasks we can discern functions. Functions are *patterns of activity with a purpose that contribute to the whole*. For example, the function of a flashlight is to shine light. Even when the specific patterns of activity remain obscured, we can have confidence that most VNSA will perform functions that fall into one of

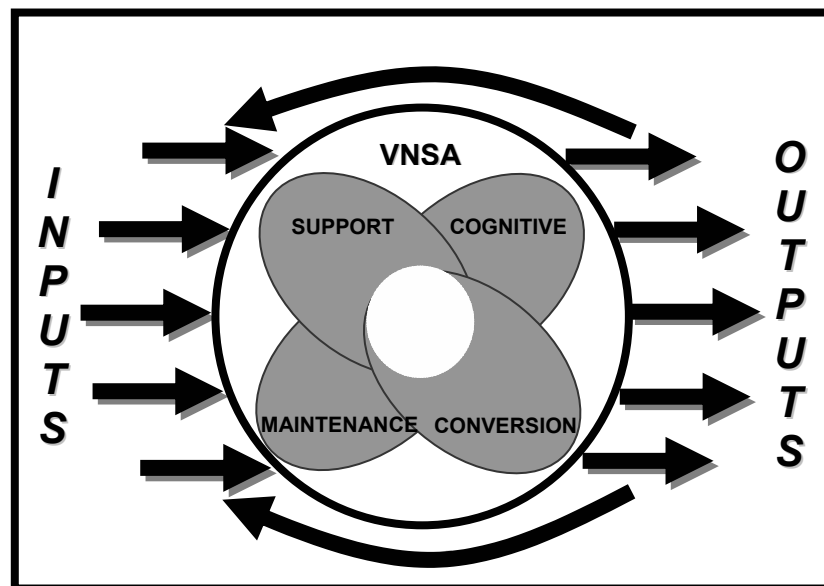


Figure 1: VNSA System

several general categories known as subsystems. Subsystems “perform the specific functions required for organizational survival, such as

production, boundary spanning, maintenance, adaptation, and management.”¹⁴

To summarize, the open systems framework asks us to analyze all organizations, including VNSA, on three levels: environment, organization (system), and internal elements (subsystems). Figure 1 depicts these three levels by showing a system, consisting of subsystems, embedded in an environment with which it exchanges energy and information. In addition to stressing the importance of conducting analysis on relationships within and across levels, we are also left with these key ideas:

- (1) An organization’s effectiveness and success depends heavily on its ability to adapt to its environment, shape the environment, or find a favorable environment in which to operate;
- (2) Organizations will use their products, services and ideas as inputs to organizational maintenance and growth;
- (3) An organization’s effectiveness depends substantially on its ability to meet internal system need—including tying people to their roles in the organization, conducting transformative processes and managing operations—as well as on adaptation to the environment; and
- (4) Developments in and outside of organization create pressures for change as well as forces for inertia and stability.¹⁵

With these key attributes in mind, we are left with a view of organizations as organic systems. That is, organizations bear more than metaphoric similarity to organisms. They grow, adapt, spawn, and in some cases, die. An ecological view of VNSA is consistent with open systems theory and informs our analysis and strategy throughout. The ecological view forces us to look at how the environment shapes the organization, which in turn, suggests strategies for affecting the environment in a profitable manner.

Contributing Concepts

This paper's effort to develop an understanding of the environment-organization interface and derive practicable strategies is buttressed by previous research. Given the importance of this research to the current project, the following paragraphs offer a summary of key contributing concepts that were examined in Troy S. Thomas and Stephen D. Kiser, *Lords of the Silk Route: Violent Non-State Actors in Central Asia*, and Troy S. Thomas and William D. Casebeer, *Violent Systems: Defeating Terrorists, Insurgents, and Other Non-State Adversaries*. Respectively, these works looked at the environmental conditions that foster VNSA and the functioning of VNSA in that environment. They also laid out the basic elements of a counter-VNSA strategy extended in this paper with a focus on environmental shaping—we seek to change the ecosystem of collective violence.

Environmental conditions, or roots of violence, ripen communities for mobilization into non-state groups. While there are many dynamic forces impacting the environment, the roots of violence proffered by us have explanatory power regarding the formation of an at-risk population, ripe for mobilization along existing identity lines, known as cleavages. From among the varied sources of human insecurity, our analysis sets forth five conditions for violence: *resource scarcity*, *demographic pressures*, *socio-economic deprivation*, *organized crime and corruption*, and *pre-existing identity cleavages*. Each places significant stress on the individual, civil society, and the state. The roots of violence are highly interrelated and a greater stress in each has a synergistic effect on whole. In regions where the synergistic effect is most acute, the environment is more likely to spawn VNSA. Grave stresses across the board are a reasonable indicator of impending group formation.

The roots of violence create optimal conditions for VNSA incubation; however, they are rarely sufficient to convert individual deprivation or communal dissatisfaction into organized violence. The engines of change that translate passivity into action are failures in governance, identity mobilization, and reinforcing behaviors. Current research focuses heavily on state failure as the primary catalyst. We agree that a weakened state is a key intervening variable; however, we amend the traditional view of state failure in terms of weakened capacity to include a broader conception of *failures in governance* to include illegitimacy due to ideological incompatibility, impotence in the ability to provide basic goods and services, and excessive coercion of the population. An often overlooked, but equally important transformation process is *identity mobilization*, where members of the disaffected community begin to associate with other identity cleavages. The psychological process of identity formation is directly relevant to forming or joining a VNSA. A key agent in this conversion is the *identity entrepreneur*, or charismatic leader that leverages the conditions of violence and failures in governance to manipulate identity cleavages. The process is not linear since VNSA will also take *reinforcing actions* to perpetuate the cycle of violence. Like organisms, they seek out, adapt to or expand the ecological niche in which they can prosper; it is a type of *niche construction* that deepens the roots of violence.

Turning from environmental analysis to a diagnosis of the organization itself, we must look at VNSA as a whole with properties that are separate from the sum of its parts as well as the internal workings of a core set of functions. At the organizational-level, the most important concepts are *life cycle*, *negative entropy*, and *congruence*. First, organizations do not magically appear on the scene.

Thomas and Casebeer—Turbulent Arena

Rather, they pass through a series of *life cycle* phases during which they change in form and function. When the conditions of violence meet a weak state and identity mobilization, incubation occurs and a VNSA enters the gestation phase. As the organization takes initial form, the VNSA will grow, adapting to its environment and becoming increasingly complex and differentiated. If allowed to prosper uncontested, or if highly adaptive even in a turbulent environment, the VNSA may reach maturity in which growth might plateau, but increased efficiencies and the birthing of VNSA progeny may occur. The life cycle is not necessarily linear, since even mature organizations continue to experience growth in some areas, and in the first of two significant divergences from the biological metaphor, organizations can reverse course. Maybe as a result of conscious strategy, but more likely due to environmental constraints, organizations can revert back to a growth phase or even gestation.

In a major divergence from the biological metaphor, the VNSA can flirt with death. Organizations can live forever. Of course, their ability to do so is contingent on many factors, not the least of which is its ability to avert the natural entropic process. The tendency toward disorder and decline – information is lost, people fail to uphold role behaviors, conditions worsen – is forestalled by building negative entropy. *Negative entropy* is the “stock of energy,” the “store of fuel,” and the “winter fat” on which the VNSA draws during periods of crisis. It is common and often appropriate to think of cash reserves, abundant recruits and back-up sanctuaries as the forms of negative entropy relied upon by the VNSA. Through systems analysis, however, other more potent and less appreciated forms emerge, including culture, socialization, social services, intelligence gathering, and command and control structures. Whatever it is, a counter-VNSA strategy must

deplete the stores of negative entropy in order to keep the VNSA from reemerging down the rode.

The third key system property, *congruence*, deals with the “fit” or “alignment” among subsystems. A VNSA is most likely to prosper when it achieves reinforcing working relationships among its parts, and importantly, between the organization and its environment—a fit our strategy seeks to disrupt through increased turbulence. Good fit works against entropy, optimizes performance, and propels the VNSA along its life cycle path. Congruence analysis requires us to determine the factors that contribute most to harmonizing the functions of the four primary subsystems of all VNSA—support, maintenance, cognitive, and conversion. The *support* subsystem manages boundary relations, acquiring resources from the environment, recruiting members and attending to stakeholder associations. The *maintenance* subsystem works on the people in the organization by socializing them to a set of values (culture)—often derived from the environment—and enforcing role behaviors through a schedule of rewards and sanctions. The *cognitive* subsystem is responsible for decisionmaking through learning, strategy development and exercising control over the organization. The *conversion* subsystem works on the energy brought into the organization, training recruits, producing goods and services, and conducting operations, which do not always involve collective violence. Each subsystem and associated functions contribute to the VNSA as a whole and take leading roles during different phases in its life cycle.

In seeking to counter VNSA, either to prevent their emergence or impact performance, four critical concepts emerge. First is the idea of *ecological deterrence*; if we accept expanded notions of both what constitutes deterrence, and what aspects of human psychology are

pertinent to it, then we discover it is possible to deter VNSA throughout their life cycles. Second, we revisit the overarching counter-VNSA concepts of congruence and negative entropy—by focusing on disrupting the "fit" between all the parts of the system that constitute VNSA, we can cause organizational breakdown; in addition, attacking the "stores of fat" that VNSA accumulate will allow knock-out blows with immediate organizational impact. Third is the notion of revised *principles of war* for combating open systems; while we should not abandon ideas such as "surprise" and "economy of force," there are other general principles that will aid us in our efforts to war-fight with VNSA. Finally, for assessing the results of our counter-VNSA efforts, we offer the idea of *measures of performance* for attacking systems: we can measure how our efforts are affecting input-related issues (resource utilization), conversion-related issues (process efficiency), and-output related issues (goal attainment).

SLICING THE ENVIRONMENT

The environment consists of everything outside the boundary of the organization, but not everything "out there" is relevant to a counter-VNSA strategy and the operations that flow from it. Therefore, analysis and action in reference to a specific VNSA occurs within the context of a battlespace. The concept of *battlespace* narrows the field by focusing on "the environment, factors, and conditions that must be understood to successfully apply combat power, protect the force, or complete the mission."¹⁶ Thus, the battlespace is what is important about everything; determining "what is important" is the hard part. It is a conceptual cut at what needs to be weighed when analyzing and selecting plans. It is a dynamic view, changing in relation to operational requirements, adversary actions, force availability, and other factors. It contracts and expands "in relation to the commander's

ability to acquire and engage the enemy.”¹⁷ Given the complexity of countering VNSA, particularly in terms of diverse missions and threat adaptability, shifts in battlespace contours are regular occurrences, if not a continuous quality. This dynamism demands a rejection of the linear thinking associated with the outmoded “battlefield.” Think of the battlespace as the non-linear offspring of the battlefield, taking in areas of the operating environment beyond the physical surface of the planet to include air, space, cyber, and more recently, social dimensions.

The concept of *dimension* is used to slice up the battlespace into manageable chunks. Where terrain and weather features once dominated, today’s multi-faceted missions against non-state groups demand consideration of surface, air, space, information, and social dimensions. Military doctrine carves these up differently; however, the core dimensions of physical, information and social come across throughout. The physical dimension includes the geography of terrain, air, space, and weather. The information dimension consists of information, information systems, and information functions; it is “any medium adversary or friendly elements could use to transfer, defend or attack information.”¹⁸ The social dimension is the most diverse and difficult to assess, and yet it is the most critical to countering VNSA. Joint and Air Force doctrine refer to it as the human dimension, but since we are really talking about characteristics of groups of people and relationships among people, the term “social” is more apt. Regardless of the label, this dimension includes “militarily significant sociological, cultural, demographic and psychological characteristics of the friendly and adversary populace and leadership.”¹⁹

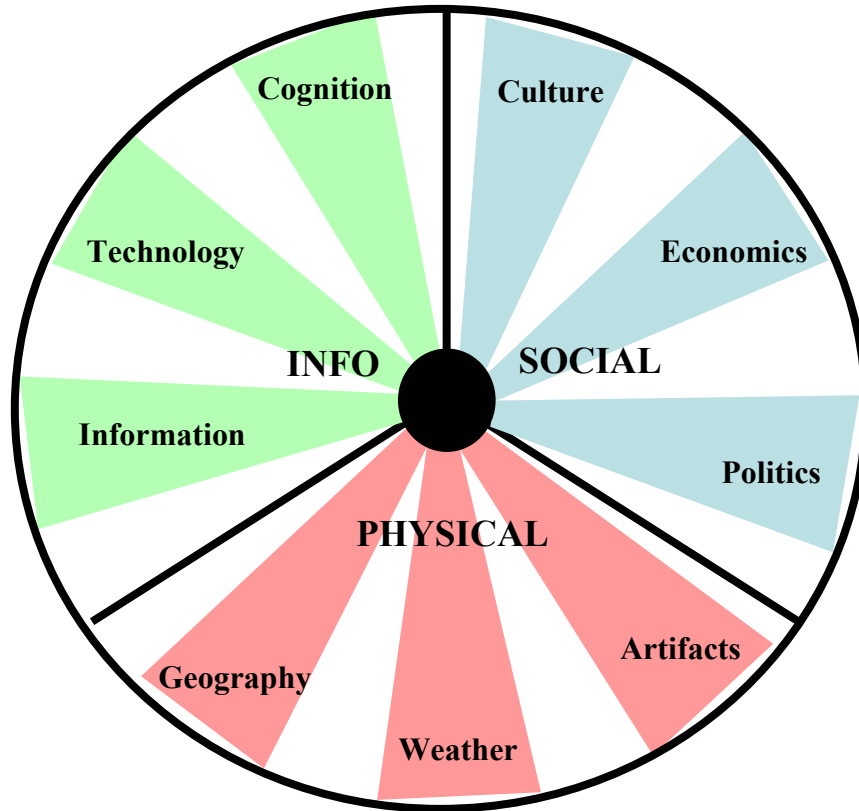


Figure 2: Dimensional Sectors

The three dimensions provide orientation and balance, but they fall short of the fidelity required to ensure we observe and orient on all the relevant features. For greater precision and to help get organized, we add the idea of “sectors” nested within dimensions.²⁰ Think of dimensions as a strategic-level construct and sectors as the operational equivalent. Dimensions frame our work. Sectors fill out the frame by grouping and relating characteristics in sub-categories that we aggregate later to provide a more holistic picture. The reductionist process of breaking down the battlespace is ultimately complemented

by an inductive process of linking tactical “facts” to strategic “theories.”

Devising sectors and their labels is more art than science. Therefore, the sectors identified in Figure 2 are a guide: rules-of-thumb. That said, these sectors do capture the dozens of characteristics highlighted throughout force protection, asymmetric conflict, information operations, MOOTW, and other appendices found in joint and service doctrine. Moreover, they reflect an appreciation for the complexity of the problem, including the diversity of missions, VNSA, and environmental dynamics. The intent is not to present the universe of relevant characteristics, but to ensure we are not neglecting any important galaxies. Time allowing, each characteristic is further broken down into four core elements: agents, space, information, and resources. For example, the transshipment of an illegal commodity such as heroin involves specific people, occupying and moving through physical space, transferring information and resources.

The physical dimension is well-developed and includes geography, weather, and artifacts. Geography encompasses the land, maritime, air, and space domains as well as hazards and diseases originating in the natural world. The land domain “concentrates on terrain features such as surface materials, ground water, natural obstacles such as bodies of water and mountains, the types and distribution of vegetation, and the configuration of surface drainage” to name a few.²¹ The maritime domain is the sea and littoral environment, while the air domain reaches from the surface to the atmosphere’s edge where space takes over. Rarely will VNSA have a space presence; however, it is increasingly common for adversaries to rely on commercial imagery and the telecommunications systems resident in space. Weather refers

to conditions in the atmosphere. Finally, artifacts are man-made features: buildings, roads, bridges, harbors, tunnels, airfields.

The information dimension is less developed than the physical, but has nonetheless received considerable attention as cyberspace, cyber security, cyber attack, information operations, computer network attack, information assurance and other “informational” concepts have come to the fore in the national security dialogue. Air Force doctrine breaks the informational domain into the information itself, the technology used to collect, exploit, assess, and disseminate it, and the cognitive style of individuals and groups.²² “Information” serves as a generic label for a hierarchy of knowledge, beginning with measurements and observations known as data.²³ When data are placed in context, indexed, and organized, they become information, and information turns into knowledge when it is understood and explained. The effective application of knowledge is wisdom.²⁴ Technology includes the tools used to collect, exploit, and create information and knowledge. IT ranges from computer chips to satellite dishes to cellular phones. In the words of “informational” expert Bruce Berkowitz, “information technology has become so important in defining military power that it overwhelms almost everything else.”²⁵ The “brain” sector refers to the ability to observe (collect intelligence), orient (develop situational awareness and fix on salient features), and decide.²⁶

The social dimension consists of at least three primary sectors, each placing collection, analysis, and operational demands. The political sector focuses on the distribution of power in the system and the rules that govern political interaction. Relevant characteristics might include the role of inter-governmental organizations (IGO), international laws and treaties, criminal court jurisdiction, rules of

engagement, and failures in governance due to incapacity, illegitimacy or excessive coercion.²⁷ The form of government, the extent of civil society, and on-going conflict resolution measures are just a few additional considerations. The economic sector will include the availability of goods and services, market tendencies, rules governing trade, illegal commodities (drugs, guns, humans), unemployment, bank accounts, money laundering schemes, exchange rates, and many more factors related to the trade in goods and services.

The culture sector is the least understood and yet the most important as we deal with today's non-state adversaries. Cultural intelligence is gaining prominence, and intelligence professionals are increasingly called on to understand the sociology and psychology of their opponent. Attempts at "actionable" cultural intelligence often fall short, resulting in interesting histories, customs and folklore. Cultural intelligence deserves more attention and increased study.²⁸ As operationalized here, cultural intelligence looks at the norms and values that shape individuals, groups, and communities. Breaking it down, "norms make explicit the forms of behavior appropriate for members" of the group being evaluated.²⁹ To determine if a norm is a property of the group or community in question, the following criteria must be met: 1) there is evidence of beliefs by individual members that certain behaviors are expected; 2) a majority of group members share the belief; and 3) there is general awareness that the norm is supported by most of the group's members, not just the leadership.³⁰

Collectively, values constitute the group's ideology and provide a more "elaborate and generalized justification both for appropriate behavior and for the activities and functions of the system."³¹ Values become norms when they are operationalized by the group members in terms of specific behaviors. Two value systems tend to dominate:

Thomas and Casebeer—Turbulent Arena

transcendental and transactional.³² Religious extremist, single issue, and ethnic separatist groups embrace a transcendental value system, which places emphasis on morality, sacred duty, the supernatural, and symbolism. Transcendental values are difficult to inculcate, but are more effective in sustaining loyalty. Transnational criminal organizations (TCO) and warlords with private militias epitomize the transactional or pragmatic value system with their emphasis on amassing wealth or power. The transactional value system can be rapidly developed, but it is also more susceptible to disruption and defection in the face of a superior threat or more lucrative alternatives for members. The most effective groups foster a dual value system, manipulating symbols and delivering tangible value. Dual-value systems have the added advantage of offering reinforcing sources of adaptability; faith can often be sustained even when cash runs short.

Culture emerges from the evolution and propagation of norms and values. Diagnosing culture is exceedingly difficult, but when successful, cultural insight provides answers to practical issues, including: who matters, where are boundaries, why and how does work get accomplished, what are problems, and what is most important to the community or terrorist group.³³ Cultural strength, or the extent to which members share the norms and values, is the community's glue. It is a strong and often overlooked source of cohesion and survivability in social organizations—it is negative entropy. A terrorist group with a strong culture, such as the IRA or Hezbollah, is more likely to enjoy greater member commitment. An organization with an inflexible or weak culture will have greater difficulty dealing with environmental turbulence.

BATTLESPACE EFFECTS

The effects emanating from the battlespace are dynamic, and they will routinely shift as VNSA seek new advantages to counter our latest strategy or due to changes in battlespace conditions. For example, Al-Qaida relied on the global financial network to rapidly move money through wire transfers, credit transactions, and multiple bank accounts; however, increased international cooperation to disrupt terrorism financing forced a shift in strategy emphasis by al-Qaida financiers to an informal banking system known as *hawala*.³⁴ The relationships between changes in the battlespace and organizational behavior are hard to discern and even more difficult to predict. Even when the result of a specific policy or action can be readily observed, delayed and unexpected outcomes are rarely anticipated in full. Nonetheless, it is incumbent upon policy-makers and implementers to at least attempt to understand and forecast the range of effects that might spring from action or inaction. When trying to develop a counter-VNSA strategy, the more specific task is to appreciate how changes in the battlespace relate to changes in the organization. To that end, we begin by defining effects and then turn attention to the different methods to assessing the most relevant battlespace effects across the dimensions.

Defining Effects

An effect is “the physical, functional, or psychological outcome, event, or consequence that results from specific military or non-military actions.”³⁵ This line of thinking is the basis for effects-based operations (EBO), which is the

process for obtaining a desired strategic outcome or “effect” on the enemy, through the synergistic, multiplicative, and cumulative application of the full range of military and nonmilitary capabilities at the tactical, operational, and strategic levels.³⁶

These definitions make sense when we think from the organization out. But this is only half the equation—we must reverse the cause-effect directional arrow. In addition to thinking about how we impact the battlespace, we must figure out how the battlespace affects us, our adversary, and other players. That is, countering VNSA is not simply about one organization (joint military force) acting against another (terrorist group). Rather, these actions are distorted by the medium of the environment, and the environment can impact all organizations party to the contest in a manner that is independent of the original action. In reality, the relationship between the organization and the environment is open, dynamic, and hard to discern. From a systems perspective, the organization is continually exchanging energy and information with the environment; organizational behaviors are shaped by environmental conditions, and the environment is in turn shaped by the organization. The trick is to think in both directions all the time.

Thinking in terms of effects begins with a seemingly simple question: Does the action or environmental feature have an impact or not? Will persistent sandstorms restrict operating windows, or will local opinion allow intelligence gathering? Yes or no? Such simplicity is an important start, but it is of limited utility to understanding how the feature will impact the VNSA, whether the effect represents a constraint or opportunity, and how all the effects interact to create comparative advantage or disadvantage relative to the adversary. To get beyond binary answers to a laundry list of factors, we begin by distinguishing between direct and indirect effects.

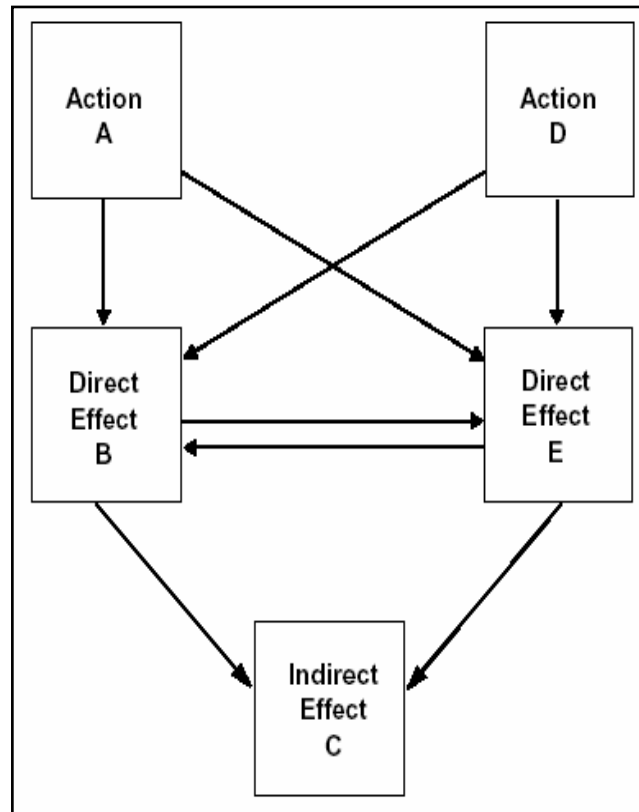


Figure 3. Direct and Indirect Effects

Source: USAF Doctrine Center briefing, “Strategic and Indirect Effects: Defining and Modeling,” reprinted in T.W. Beagle, “Effects-Based Targeting: Another Empty Promise,” (Maxwell Air Force Base, AL: Air University Press, December 2001), 6.

Direct effects have an immediate, usually recognizable impact in time and space with no intervening effect or mechanism between act and outcome.³⁷ Conversely, *indirect effects* tend to be delayed in time and space, resulting from an intermediate effect or mechanism to produce the final outcome; they are much more difficult to recognize

(Figure 3).³⁸ Indirect effects are less important for tactical level action, but become increasingly important as we move through the operational level of military action to the strategic level of policy. As an example of a direct effect that cannot be discarded during military planning, consider the relationship between a group targeted by a psychological operations message and the behavior of an influential religious leader in the region. In the sectarian cauldron of violence that is Kaduna, Nigeria, for example, it would be foolish to ignore the relevance of Islamist firebrand, Ibraheem Zakzaky. Located farther north in Zaria, Zakzaky recently declared, “If we want a million people out on the streets on any issue we can do that.”³⁹

Effects are a two-way street, impacting friendly forces and the adversary. For example, a direct effect against a terrorist group, such as the Moro Islamic Liberation Front (MILF) in the southern Philippines, might be the disruption of training as a result an attack on their jungle camp. The indirect effect of disrupting training is likely to be a decrease in attacks down the road, or even a longer training program with smaller throughput due to increased concealment requirements. According to a MILF field commander, codenamed “Congressman,” the destruction of their main camp, Abu Bakr, in 2000 by the Philippine Army has forced them to break up in to smaller, more mobile guerilla units and confine leaders to secret locations, combining to make training more difficult.⁴⁰

Thus, the first and most basic step in effects-based thinking is to distinguish between direct and indirect effects. At a minimum, policy and operations must anticipate direct effects and make an initial cut at potential indirect effects to avoid being blinded by beyond-the-horizon forces. In the sections to follow, we take on the challenges associated with understanding, generating, and forecasting indirect effects through

an examination of net and dimensional effects. We do this wide-eyed with the understanding that forecasting effects is difficult, but that we can at least develop a framework and identify general types of effects with global relevance as a starting point.

Net Effects

The inverse of the inductive approach sketched above is a deductive method based on a more generalized portrayal of the battlespace. Rather than looking from the organization out, we think from the battlespace in—can we describe the overall battlespace in a way that lends insight to probable impacts on all participants? How players respond to these overall dynamics determines who derives the most advantage. Political and organizational theory offers some useful concepts toward achieving this goal, and here they are applied to assess net, or overall effects related to *uncertainty*, *nesting*, *stakeholders*, *dependencies*, and *affordances*. Net effects help us get a general fix on how messy the situation is, who the major players are, and what constraints and opportunities are present.

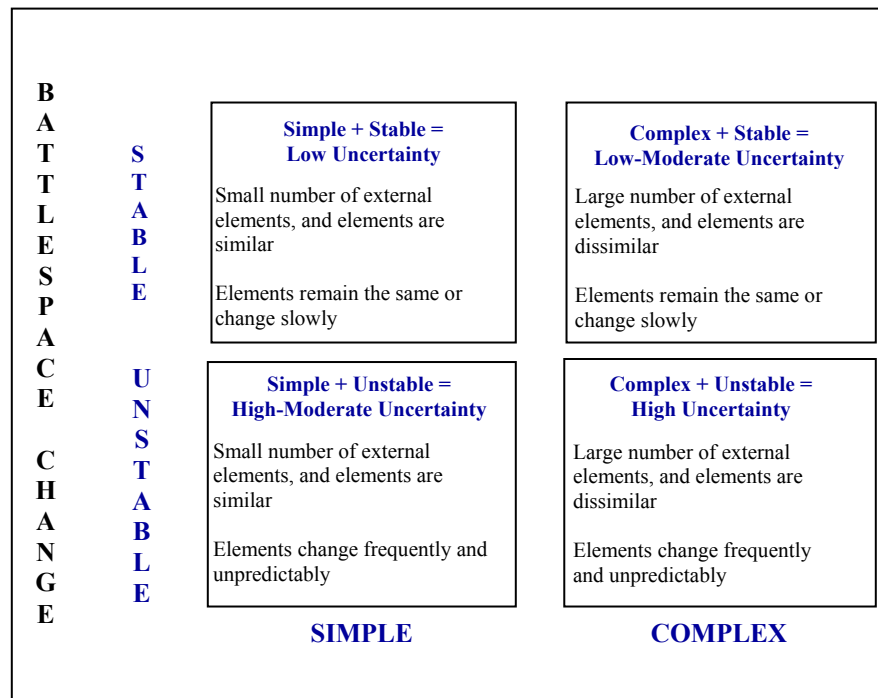
Uncertainty

The battlespace is turbulent, creating uncertainty for all players.⁴¹ Uncertainty, commonly attributed to the battlespace, is actually experienced by decisionmakers. It is akin to the Clausewitzian “fog of war.” The denser the fog, the greater the risk to all participants and the more likely performance will decline. Uncertainty is a more useful concept than its seeming ambiguity suggests. It has specific components, *complexity* and *change*, that are evaluated to characterize the battlespace and suggest implications for the organizations in it. Moreover, knowledge of the contributors to battlespace uncertainty can lead to strategies for increasing turbulence that hurts VNSA.

The degree of uncertainty is influenced by a simple-complex axis, which “refers to the heterogeneity, or the number and dissimilarity of external elements relevant to an organization’s properties.”⁴² More directly, how cluttered is the battlespace with things of concern to our plans? As the numbers of relevant features and other organizations (friendly, neutral, or adversarial) in the battlespace increase, so does the complexity. For example, the battlespace in Afghanistan during Operation Enduring Freedom gained complexity as relief NGOs; outside terrorist organizations, such as the Islamic Movement of Uzbekistan (IMU); and additional coalition forces poured in. Moreover, changes in weather, the influence of the heroin trade, refugee flows, and attacks on cultural objects like the Buddhist statues at Bamiyan, and a host of other variables added to the complexity even before the operation began.

Uncertainty is also influenced by a stable-unstable axis, which refers to whether elements in the battlespace are dynamic.⁴³ Are things changing? In a stable battlespace, the mission-relevant features experience little change over time. At the other extreme, the unstable battlespace is characterized by abruptly changing and shifting features. Instability in Afghanistan was increased by rapidly shifting alliance between tribes, a prison revolt in Mazar-i-sharif, unexpected levels of resistance in the Tora Bora region, and other dynamic features. Figure 4 pulls these two axes together in a way that allows us to quickly size-up the degree of uncertainty faced. The battlespace gains uncertainty as timelines, vulnerabilities, hostile interference, stakeholders, and other factors increase. The role of US intelligence is to reduce our uncertainty relative to the terrorist, while counter-VNSA actions seek to increase adversary uncertainty to undercut performance.

The degree of uncertainty in the battlespace has general effects on decisionmaking, organization, and planning. Change and complexity impact decisionmakers by altering their intelligence demands. Meeting shifting requirements consumes resources and energy, and the resulting availability of needed intelligence can enable or hinder decisionmaking. A complex-stable battlespace, for example, can result in information overload. A complex-unstable battlespace generates an “overwhelming amount of information, but [decisionmakers] will not know which



BATTLESPACE COMPLEXITY

Figure 4. Uncertainty Framework I

Source: Adapted from Robert B. Duncan, “Characteristics of Perceived Environments and Perceived Environmental Uncertainty,” *Administrative Science Quarterly* 17 (1972), 313-327.

information to attend to due to constantly changing circumstances.”⁴⁴

To get a clearer picture of whether uncertainty breeds indecision or poor judgment among blue, red or other decisionmakers, this net assessment should be integrated with the psychological profiling of specific decisionmakers if possible. Some commanders and terrorist group leaders are capable of good judgment under uncertainty, but many are not.

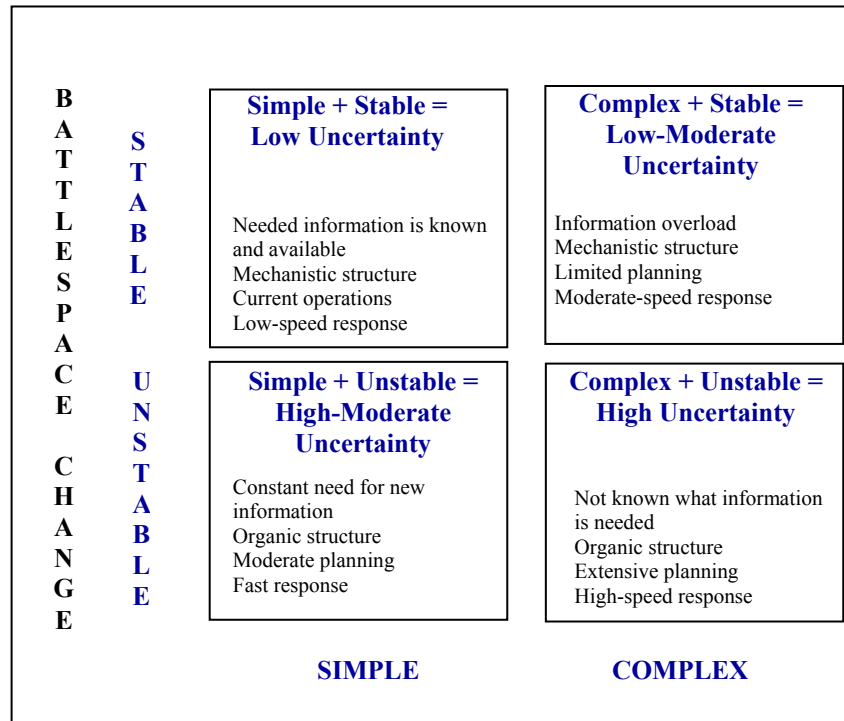
Uncertainty also drives organizational structure. Drawing again on systems thinking, the *law of requisite variety* states that

for one system to deal with another it must be of the same or greater complexity. In organizational terms this means that organizations map perceived environmental complexity with their internal structures and management systems. There is a theoretical limit to this, of course, since if the organization ever realized the full complexity of its environment, it would be that environment.⁴⁵

This means the battlespace will influence the command and control structure and function of us and our adversaries. A failure to fit (congruence) one’s organization to the battlespace can result in a lack of adaptability, missed intelligence, and ultimately, decreased performance. What structures result? A stable-simple battlespace fosters a *mechanistic* organization, marked by formalized rules and procedures, clear hierarchy of authority, rigidly defined tasks, centralized planning and decisionmaking, and vertical communication.⁴⁶ It is the epitome of the modern bureaucracy. The mechanistic organization improves efficiency, but it also reduces the ability to adapt and pursue alternative strategies. Mechanistic organizations are generally rigid and rational, which makes them vulnerable. Where uncertainty reigns, *organic* organizations prove more successful—communication is horizontal, knowledge is diffused, control is lessened, hierarchies are flattened, tasks shift to reflect new

demands, and decisionmaking is decentralized.⁴⁷ Organic organizations are a better fit for VNSA, often resulting in an asymmetric command and control advantage until nation states and military forces adapt.

Uncertainty also impacts planning. Planning and forecasting is increasingly important as instability and complexity go up. In a placid battlespace, organizations are free to focus on current problems and operations—the day-to-day efficiency of recruiting or training. Turbulence, on the other hand, creates the need for more detailed



BATTLESPACE COMPLEXITY

Figure 5. Uncertainty Framework II

Source: Adapted from Richard Daft, 152, and Mary Jo Hatch, 91.

planning, more options, improved forecasting of adversary courses of action, and the ability to respond quickly. Response speed refers to the ability to execute a plan without delay when the battlespace affords optimal advantages. The effects of uncertainty on information requirements, organizational structure, and planning are summarized as rules-of-thumb in Figure 5. In terms of a counter-VNSA strategy, we should shape the VNSA's battlespace toward high uncertainty while simultaneously acting to undermine the mechanisms it uses to adapt.

Nesting

Effects are often thought of in horizontal terms, flowing across organizations—inputting inferior weapons results in decreased combat effectiveness later. Effects also flow vertically across level of analysis and action. The three levels are the strategic, operational, and tactical. The operational level “determines WHAT we will attack, in WHAT order, and for WHAT duration.”⁴⁸ The operational level links tactical engagements to strategic objectives. Tactical engagements deal with how we fight, while the strategic level addresses “WHY and WITH WHAT we will fight and WHY the enemy fights us.”⁴⁹ Although the levels of analysis and action are often treated separately, we must think in terms of planning, operations, and effects that transcend levels. That is, a tactical-level action can have strategic effects and strategic-level planning will shape tactical behaviors. Moreover, “success” or “defeat” at one level may not translate to the others—we can win battles, but still lose wars. Essentially, the levels provide a theoretical scaffolding to frame our work and understand the flow of action and effects across the battlespace.

Effects cascade “when they ripple through an enemy target system, often influencing other target systems as well. Typically this can influence nodes that are critical to multiple target systems.”⁵⁰ These

indirect effects do not just influence targets, but they influence all stakeholders and the battlespace itself, usually flowing across levels. To help understand the cascading influences of nested effects, consider the following brief examples. An operational consideration in targeting a terrorist training camp might be insight to the school of Islamic thought embraced by the camp's protectors, which has implications for how prisoners of war (POW) might be treated.⁵¹ This operational-level analysis informs tactical-level evaluation of specific religious and tribal leaders who have a stake in protecting or supporting the camp. The convictions of a specific Islamic school of thought, such as Wahhabism, influences a global trend in the resurgence of a more fundamentalist, or even radical approach to Islam, which in turn forges a global movement of *jihadists* that embolden and support the initial school of thought at the operational level.⁵² Globalization offers another example of nested effects. Globalization is a strategic-level dynamic that impacts communication infrastructures among belligerents at the operational level, which shapes the types of specific devices—cell phones, email, courier—used at the tactical level. Trends in developing world socio-economic development, such as increasing disparity between the poor and wealthy or rising infant mortality rates, translate into failures in governance at the operational level, which enables terrorist groups and other criminals to operate with impunity in the state's hinterlands. The not-so-new "idea" here is that our analysis of battlespace effects must move vertically as well as horizontally.

Stakeholders

Naming and correctly identifying the adversary, particularly when dealing with contemporary Islamist extremist groups, is complicated by rapidly shifting, self-proclaimed group titles, multiple memberships by individual terrorists, and blurred connections between groups,

Thomas and Casebeer—Turbulent Arena

movements, and communities. The transnational nature of threat also requires cooperation across nation-states and with inter-governmental organizations like the United Nations, European Union, Association of South East Asian Nations, and others. To the mix we will also add roles for private individuals, NGOs, neighborhood associations, religious communities, private security firms, and other VNSA. Placing these within a cultural or ideological context, fueled by the rapid dissemination of information, leaves a cauldron of complexity. A good counter-VNSA strategy starts by getting a fix on this mess, and a good place to start is by mapping out the stakeholders.

Stakeholders are individuals and organizations with an interest in the outcome of the contest. The contest with VNSA plays out in a multi-centric world, where power and influence is diffused across actors. Civil-military affairs and psychological affairs missions, for example, are directly influenced by the presence of developmental and relief NGOs like NetAid or Refugees International, and the long-term influence of local leaders, including tribal chiefs, mayors, clerics, priests, shaman, elders, and school teachers. Even direct action missions to take down a sanctuary or capture a leader are likely to occur in a social context, possibly an urban battlespace, where families, businesses, and entire communities become involved. As an example, Israel's targeted assassinations of two Hamas leaders in February and April 2004 roused vast street demonstrations, resulted in the deaths of civilians, and destroyed infrastructure. Mapping these diverse stakeholders is a form of social network analysis that results in a picture of the interorganizational network.⁵³

The resulting stakeholder picture is a useful reminder that our policies and operations navigate a complicated terrain of multiple actors with shifting loyalties and varying degrees of influence. It

provides initial insight into the relationships the terrorist may draw on to survive in the face of a concentrated counter-VNSA effort. For example, it is widely held that the Revolutionary Guard of the Iranian armed forces maintains a stakeholder interest in the Hezbollah in Lebanon, providing a range of support services to include money, sanctuary, and training. Strings are attached, although their strength remains a matter of dispute. In its 16 February 1985 foundational letter, Hezbollah asserted

We, the sons of Hizb Allah's nation, whose vanguard God has given victory in Iran and which has established the nucleus of the world's central Islamic state, abide the orders of a single wise and just command currently embodied in the supreme Ayatollah Ruhollah al-Musavi al-Khomeini, the rightly guided imam who combines all the qualities of the total imam.⁵⁴

With the death of al-Khomeini, the rise of more moderate political forces in Iran, and Hezbollah's growth into a dominant social, political, economic, and military organization in Lebanon, it can be reasonably argued the Hezbollah no longer takes orders from Tehran. Therefore, the character of this important stakeholder relationship has changed.

In terms of methods for getting at these relationships, we must first inventory all possible stakeholders, including, but not limited to state sponsors, sanctuary or safe haven providers, individual financiers, charismatic leaders, weapons suppliers, diasporas, corrupt officials or agencies, sympathetic communities, financial institutions, and other terrorist groups. Too often, social network analysis only looks at the adversary's relationships, but the entire network, including friendly and neutral actors, should be addressed to get at the overall relational nature of the contest. Second, we must develop a basic assessment of their influence on participants—three “influences” are useful. First, is the stakeholder likely to have a direct or indirect influence? A direct influence indicates the stakeholder impacts decisions or actions

immediately—a religious leader can withhold divine sanction for a terrorist act, or an ally can veto an operation. Indirect influence may degrade performance in the near-term, but is more likely to impact decisions or actions down the road. A regular weapons supplier who backs off the sale of black-market shoulder-launched surface-to-air missiles will not stop tomorrow's attack on a civilian airliner, but he may be able to undermine future planning.

Second, is the influence likely to be adversarial, friendly, or unknown? Of course, these generic labels can mean many things, ranging from active support with intelligence or combat force to passive support by acquiescence to a mission in neighboring territory—Russian tolerance of US-supported operations in the Pankisi Gorge, Georgia in 2002. Finally, toward what other stakeholders is the influence likely to be exerted? How we label these characteristics is less important than understanding who the relevant players are beyond the named VNSA and what impact they are likely to have on the mission. A simplified, conceptual example of stakeholder mapping to reveal the interorganizational network of influences is shown in Figure 6. Of note, this map only shows a few stakeholders and their relationship to the US joint force or the notional terrorist group; a more accurate map will also show relationships among the stakeholders. Furthermore, mapping external relations is probably one of the most difficult tasks for intelligence, so it is important to highlight degree of certainty.⁵⁵ The result is a *web of influence* that provides insight into the effects other players are likely to have in terms of assistance, interference, or neutrality. Thus armed, we can seek to exploit alliances, flip or disrupt hostile parties, or persuade the uncommitted. Moreover, it suggests how the VNSA or another stakeholder might

respond to one of these moves based on their direct or indirect relationships.

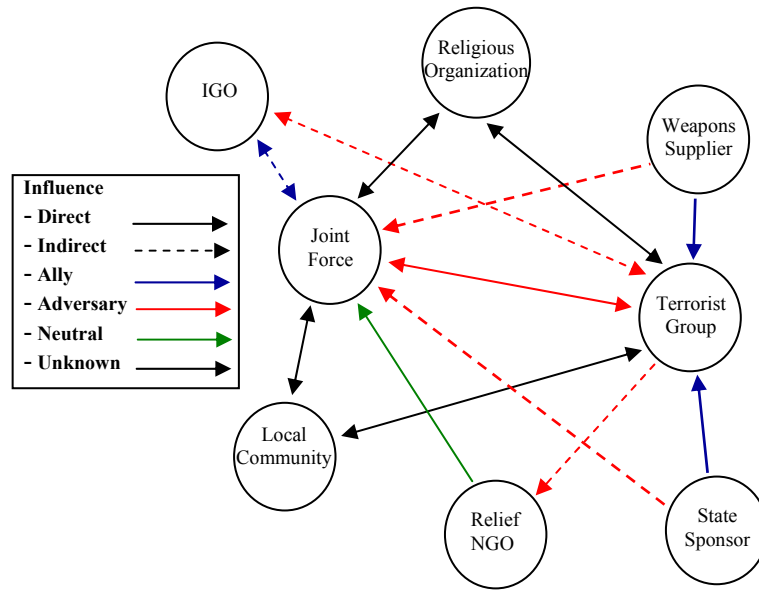


Figure 6. Stakeholder Effects

Source: Author.

Dependencies

A fourth option for thinking about net effects is the concept of dependency. Dependency moves us closer to an organizational perspective, but still offers a general concept for identifying and defining the influences of the battlespace. The idea is that the battlespace is the source of scarce resources that are critical to survival,

or less dramatically, to performance. The concept has its roots in resource dependency theory, which argues in its simplest form that the battlespace is a powerful constraint on organizations. Thus, resource dependencies must be effectively managed to guarantee the organization's survival and "to secure, if possible, more independence and freedom from external constraints."⁵⁶ For the purposes of a counter-VNSA strategy, "resources" is a broad term, encompassing information, money, technology, divine sanction, allies, skilled operatives, and others.

Dependency is measured in terms of criticality and scarcity. *Critical* resources are vital to system function. Individuals committed to suicide bombing are a critical resource of Hamas and Islamic Jihad now and the LTTE (Sri Lanka) in the past. *Scarce* resources are not widely available in the battlespace, causing intense competition for them—diamonds and plutonium are scarce, landmines are not.⁵⁷ Unfortunately, willing suicide bombers are also abundant. Resources that are critical and scarce demand the greatest organizational attention and may represent an exploitable vulnerability. Critical resources that are widely available, or scarce resource that are not critical, create less vulnerability, while non-critical, abundant resources do not constrain performance. As we analyze the battlespace, we should ask whether we or the VNSA are dependent on any resources whose disruption could undermine performance. For civil-affairs missions, for example, a dependent relationship is likely to exist with community leadership; whereas, the capture of a terrorist cell leader may be dependent on an unobstructed route in and out of the labyrinthine suburb slum.

Affordances

The final "net effect" seeks to capture an overall assessment of what the battlespace affords. The goal of affordances is to determine

whether the battlespace affords advantages (opportunities) or disadvantages (constraints). If, for example, our analysis suggests the attitudes of the local population will directly impact an operation, we must also determine whether existing attitudes are favorable (opportunity) or unfavorable (constraint). Of course, the challenges associated with collecting accurate intelligence about attitudes and intentions make it difficult to have a high degree of confidence in the results; the goal is a general sense of what the battlespace affords as the basis for more targeted intelligence collection and analysis. In this net assessment of opportunities and constraints we must incorporate an appreciation for the inherent limits of human perception. The argument that what we perceive about the battlespace is more important than what it actually presents is rooted in *affordance theory*. The perception theorist James J. Gibson invented the word “affordances” to refer to “the offerings of the environment, roughly the sets of threats (negative affordances) and promises (positive affordances) that characterize items in the environment relative to organisms.”⁵⁸ That is, we see constraints where none exist, and we fail to recognize opportunity when it knocks. What we think we see is more relevant to the actions we choose than what is really out there. Essentially, it is another cautionary tale against mirror-imaging, reminding us that the VNSA and other stakeholders may behave in unexpected ways and charging us to creatively turn obstacles into opportunities.

Dimensional Effects

In addition to adopting the five general concepts and methods for analyzing net effects, we can also derive dimension-specific effects that help us understand and influence VNSA. Of the three dimensions, the physical is well developed in current military doctrine and frankly, is often given attention that is disproportionate to its value in dealing with

VNSA. Therefore, this section elevates the importance of informational and social effects, which in turn suggests areas for improved intelligence work and strategy.

Information Effects

Whether dependency and uncertainty exist is a result of the interplay among information, technology, and cognition. Information effects warranting investigation relate to organization, publicity, and decisionmaking. The information dimension affords opportunities and constraints as a result of the availability and quality of information, the sophistication and reliability of technology, and the limitations of human cognition. We are well aware of the information dependencies of the US military in particular, but there is also general consensus among terrorism experts that among the various trends over the last decade,

[w]hat has been particularly significant has been the logical extension of the profound impact of television and satellite communication through the rapidly developing and expanding use of the Internet and the revolutionary change that characterizes all aspects of computer technology. The terrorists now have at their disposal the medium to disseminate information and increasingly coordinate attacks against a wide range of targets from the relative safety of cyberspace. In addition they will increasingly be able to conduct terrorism against the vulnerable technological infrastructure of industrial and post-industrial societies by targeting critical infrastructure, particularly in reference to computer facilities and networks. Through their actions, they will have the potential to directly and indirectly place large numbers of people in harm's way by degrading an air traffic control network, public health care system, or other complex systems that can profoundly threaten both personal and societal security.⁵⁹

The information dimension is having profound effects on the shape and capabilities of the US, and has enabled NGOs, IGOs, VNSA, and other stakeholders to extend their reach and increase their effectiveness. Among *organizational effects*, advances in IT combined with declining

costs of processing are impacting command and control structures. Increasingly, the old hierarchical, cell-based VNSA is giving way to IT-based networked organizations. According to RAND analysts, many of the newer Islamist extremist groups, such as Hamas, have become more “loosely structured,” with activists using chat rooms and email to coordinate activities.⁶⁰ IT, and the Internet in particular, enable several other organizational functions, including collecting and sharing information, recruiting, publicizing propaganda, debating agendas, coordinating action, and conducting attacks.⁶¹ Internet-based recruiting is just one powerful example of how IT can dramatically change the capabilities of a VNSA. Websites routinely post “be all you can be” videos, martyr testimonies, and interviews.⁶² Our counter-VNSA strategy can leverage informational effects by determining the availability of IT, what capabilities it affords, what are its vulnerabilities, and what are the consequences associated with its disruption or failure. At the same time, we must not overestimate the role of IT for organizational purposes. Al-Qaida’s famed reliance on satellite phones quickly gave way to an old-school courier service—a reminder that technology is a double-edged sword.

The media is the landlord of the information space. Publicity is central to the violent theater of VNSA employing terrorism, ensuring that *media effects* are integral to our strategy. For example, there is a natural symbiosis between the terrorist and the media. Terrorist groups exploit media coverage to extend the psychological impact of the act of violence on the target audience. Examples span the history of terrorism, but just during the time of this writing, media coverage of the bombing in Madrid and Riyadh, suicide attacks in Israel and the Palestinian territories, elevated threat levels in US, and a video-taped beheading in Iraq have all contributed to increased public anxiety and

Thomas and Casebeer—Turbulent Arena

ensured widest coverage of propaganda by deed. When press coverage is absent, terrorists generate their own through faxes, newspapers, and increasingly, websites. The idea that media coverage provides the terrorist with tactical and operational advantages is supported by terrorism expert Walter Laqueur, who argues that “media coverage has provided constant grist to the terrorist mill; it has magnified the political importance of many terrorist acts out of all proportion.”⁶³ It is not clear, however, whether it always has strategic benefits, as put forth by Hoffman

While terrorists certainly crave the attention that the media eagerly provides, the publicity that they receive cuts both ways. On the one hand, terrorists are indeed assured of the notoriety that their actions are designed to achieve; but, on the other, the public attitudes and reaction that they hope to shape by their violent actions are both less predictable and less malleable than either the terrorists or the pundits believe.⁶⁴

In addition to figuring out the impact of the media on VNSA behavior, effects on the US must also be factored. Key issues to determine overall media effects include reporter access; the media outlet’s capacity to communicate locally, regionally, or internationally; the likely spin to be put on our actions; the opportunity to shape the story; and other concerns that shade into public affairs or psychological operations. To be clear,

psychological operations use specific techniques to influence favorable behavior or beliefs of non-US audiences. In contrast, joint PA [public affairs] operations should not focus on directing or manipulating public actions or opinion. They provide a timely flow of accurate information to both external and internal publics. While they reinforce each other and involve close cooperation and coordination, by law PA and PSYOP [psychological operations] must be separate and distinct.⁶⁵

Strictly on the public affairs side, the media provide advantages for a range of counter-VNSA actions. A civil-affairs mission to the jungles

of the southern Philippines, for example, might leverage media effects to advertise the public benefits of the mission, keep citizens informed of health concerns, and coordinate meetings to increase participation. On the flip side, media presence can undermine surprise, expose and fuel VNSA behaviors. The type of media effects desired and realized will depend on the mission, but as a general rule for the “hearts and minds” emphasis of countering VNSA, the advantages outweigh the risks.

The stress thus far on IT is not meant to diminish the criticality of the brain piece. In fact, the cognitive styles of individuals and groups as well as the attitudes, beliefs, and perceptions of other stakeholders, including the public, is probably the most important. Why are people joining Hamas in droves? Why did she become a suicide bomber for Hamas? What are bin Laden and Musab al-Zarqawi planning? Is this community sympathetic to us or to Ansar al-Islam? What are public attitudes toward our presence in Najaf? These are important questions, but very, very difficult to answer. In terms of *cognitive effects*, we should seek answers using HUMINT as we can, but it is more likely that such insight will come from the participants themselves, who give speeches, make martyrdom tapes, give interviews, and participate in public opinion polling. Cognitive inquiry, particularly psychological profiling and opinion analysis, are integral to the analysis of the adversary. At this point, it is sufficient to note that cognitive effects spring from the individual mind, organizational behaviors, and public attitudes. Cutting across these cognitive domains are several general influences, or factors, that will affect the decisionmaking and perceptions of all stakeholders—bounded rationality, the role of affect, and the importance of narrative.

Cognitive biases are limitations on all decisionmaking. US actions must anticipate that other stakeholders will not only suffer from the same biases, but that we must be careful in assuming their actions are the result of a rational calculus. An old idea remains salient here—bounded rationality. Decisionmakers “often lack important information [uncertainty] on the definition of the problem, the relevant criteria,” the range of possible outcomes, and other factors.⁶⁶ As a result, it is very difficult for us or our adversary to always calculate the optimal choice; instead, we often forego the “best solution in favor of the one that is acceptable or reasonable.”⁶⁷ Even when we cannot get at the VNSA’s calculus, we can appreciate that all stakeholders are affected by limits on ability to choose. Organizational decisionmaking suffers from the same constraints. There is a lot of room for work on the cognitive front, particularly with regard to decisionmaking, and while this research unfolds, we must rely on historical precedent, public statements, and confidential communications to get at the decisionmaking style of the adversary. Getting at public perception is equally difficult, but not impossible. Given its integral relationship with cultural factors, it is picked up in the next section.

Social Effects

The links between violence by sub-state groups and the sectors of the social dimension are profound. Modern religious extremism, for example, reflects the cultural influence of religion, the power imbalances of the international system, and the socio-economic conditions of its constituents. US strategy, in turn, reflects Western values, the state system, and economic strength among other qualities. The health standards in a local village affect the type of clinic that should be built. Various factors ranging from religious beliefs regarding fasting to norms governing nocturnal habits drive mission

timing. Preferences of local leaders impact rules of engagement. Kinship ties open doors to new intelligence. Codes of honor prevent the surrender of a terror suspect. Social effects flow from the political, economic, and culture sectors. Effects stemming from the political sector span the levels, from alliances to rules of engagement. The economic sector shapes commerce, finances, land use patterns, industry, public services, employment and other characteristics that may provide opportunities or constrain options. Finally, culture affects behavioral norms and worldviews. Collectively demographic analysis might reveal the role of ethnicity, age, religion, income, and other population qualities in shaping public opinion, socio-economic development, or the use of violence. Since it is not possible to address every type of effect in this bucket, the following discussion integrates the cultural, political, and economic features into an analysis of demographic, cultural, and perception effects.

Demographic analysis offers a picture of how the population looks on paper based on a host of defining societal characteristics, including religion, ethnicity, language, income levels, type of economic activity, or age. We are most familiar with this type of analysis, which gives us a static picture of population composition. The utility of these snapshots is that they offer a graphic representation of the positioning of relevant social features in relation to the physical dimension. Similar types of cross-dimensional mapping can be done in cyberspace. Among other benefits, they highlight possible lines of contention, areas in greatest need of assistance, and a first cut at religious preferences.⁶⁸ Of course, this type of analysis must be scalable. Increasingly, precision operations require highly localized, or micro-geographic insight to specific cities, swamps, jungles, mountains, and coast lines.⁶⁹

Grasping *demographic effects* requires going beyond the static look by analyzing changes in population composition over time. Central Asia offers a prime example of how such changes can create demographic pressures on communities, ripening individuals for recruitment and fueling terrorist rhetoric. The compositional factor most often associated with demographic pressures in Central Asia is the “youth bulges” (where the population is skewed towards a younger demographic)—most of the developing world is experiencing a similar fate.⁷⁰ Assuming net migration is zero, persistent fertility rates above the replacement value of children per family cause the population to expand, while the converse—fertility rates below the replace value—result in a shrinking population. A rapidly increasing population places demands that are beyond the capacity of the local government, reinforcing failures in governance. When high fertility rates are combined with rapidly declining death rates, the result is a population explosion that will persist until the demographic transition is completed by a corresponding decline in fertility.⁷¹ This population explosion has been forestalled in Central Asia due primarily to acute underdevelopment and migration which has kept death rates relatively high. Nonetheless, the relatively high fertility rates and strong growth rates are creating demographic pressures that are destabilizing. These trends can be shown on an overlay that links age to employment to location.

Another approach to understanding how the population looks in practice is cultural intelligence, which “augments demographic analysis by describing how demographic traits and relationships between groups can act, or have already acted, to stabilize or destabilize conditions.”⁷² *Cultural effects* are a function of deep-seated norms and values. With good planning, we should gain familiarity of the local culture through

an inquiry of history, language, and other social studies. The USMC's on-going seminars and reports on cultural intelligence are useful in this regard. Open source literature is particularly useful for gaining solid background information that goes beyond custom and folklore. As we dig through these resources, keep an eye for norms—enacted values—that are likely to characterize interaction with the adversary or another stakeholder. To illustrate, Margaret K. Nydell's book, *Understanding Arabs: A Guide for Westerners*, is a highly regarded study examining Arab values:

- (1) A person's dignity, honor, and reputation are of paramount importance and no effort should be spared to protect them, especially one's honor;
- (2) It is important to behave at all times in a way which will create a good impression on others;
- (3) Loyalty to one's family takes precedence over personal needs; and
- (4) Social class and family background are the major determining factors of personal status, followed by individual character and achievement.

In four bullets, Nydell provides deep insight to the nature of likely interaction on the Arab street and with other stakeholders. Community leaders, for example, are unlikely to admit failure; they will lie to you before compromising their family; and they are unlikely to challenge poor-performing high-ranking officials. When background research is not possible, boots-on-the-street communication and observation should focus on patterns of behavior that suggest underlying norms.

Culture drives perception, and *perception effects* determine the temperature of the battlespace. A sense of overall attitude proves useful in anticipating effects on US policy and operations. Will there be protests? Will we be welcomed? Will our presence be betrayed? Can we expect to gather street-level intelligence? Doing our cultural

homework enables current attitudes to be gauged in relation to a historical benchmark. Getting at current conditions requires aggressive street-level interaction, and if possible, public opinion polling, either formally or informally. Not without precedent, the Coalition Provisional Authority (CPA) in Iraq commissioned a poll by the Gallup Organization in early 2004 that revealed that “80 percent of the Iraqis questioned reported a lack of confidence in the Coalition Provisional Authority, and 82 percent said they disapprove of the US and allied militaries in Iraq.”⁷³ No doubt, this affects planning.

At the end of the day, we pull our analysis together into an integrated whole to enable strategy evaluation and prioritization. Essentially, we need an assessment of cumulative effects: the “aggregate of many direct or indirect effects.”⁷⁴ Given a specific policy or operational plan, we must provide an assessment of what the battlespace affords for us, the adversary, and other stakeholders.

BATTLESPACE SHAPING

Countering VNSA requires us to leverage battlespace knowledge to affect VNSA performance. Confronting violent non-state actors is no easy task, but is instead a challenge that must be undertaken with the appropriate combination of intellectual determination and cognitive humility. Learning to tackle the challenge posed by resurgent VNSA is not optional. Globalization and the concomitant erosion of the Westphalian status quo have changed the international security environment irrevocably, and the growing prevalence of VNSA in transnational conflict ensures they will remain a fixture in the world’s political ecology for some time to come. In this paper, we have offered a framework and associated concepts and methods for understanding the battlespace and several of the relevant effects that originate in it. This framework implies, in turn, a set of strategies for preventing

VNSA development, deterring them when they do gestate, and finally for disrupting their integrity across all phases of their life-cycles. The following strategy discussion urges new thinking for countering non-state adversaries and offers broad guidelines that are rooted in systems thinking.

Battlespace Manipulation

In previous research, we argued that VNSA can be deterred, especially if we are willing to broaden our notion of what deterrence (and the human psychology that underpins it) consists in. Early in the VNSA life-cycle, affective considerations are more likely to hold sway, while traditional rational actor considerations can effectively deter later in the life cycle. Ecological deterrence couples ideas regarding the importance of environmental shaping with affective and rational considerations: a more full understanding of deterrence-related psychology allows us to see how we can shape VNSA cognition across its life-span. Should coercion fail, system disruption through battlespace manipulation becomes a necessity. Conquering VNSA requires formulation of a comprehensive counter-VNSA strategy. A robust C-VNSA strategy requires consideration of all three levels of interaction, married to a life cycle account of the VNSA's development. New principles of war (leverage diachronic effects, seek "synergy minus one" interventions, disrupt well-connected nodes, leverage feedback loops, increase entropy, disrupt environment/system interfaces, pay attention to life history analysis, increase uncertainty, implement across the system, and disrupt congruence) developed in previous research guide our thinking. In the broadest terms, open systems theory then encourages us to assess the effectiveness of our C-VNSA actions in terms of input metrics (how well is the VSNA using

resources?), conversion metrics (how efficient is the conversion process?) and output metrics (are VNSA goals being obtained?).

The VNSA is a dynamic adversary. Hence, our C-VNSA strategy will itself need to be dynamic. A mantra we would do well to repeat as we formulate grand C-VNSA strategy is “time, location, application.” When will the instruments of state power be brought against the VNSA? Where in the environment or organization? To what end are they applied, and what tool (given the dynamic principles of war) will best achieve that end? Essentially, our goal must be to synchronize, or orchestrate in time, space, and action, a systems-based diagnosis and strategy for VNSA. Keeping these three questions in mind will enable us to build something like what the military calls a time-phased force deployment diagram. Military strategists use this concept to help guide the elaborate and tremendously complex process of staging military personnel and equipment during the build-up to a confrontation. A time-phased plan for all the resources that will be brought to bear across the VNSA life-cycle would be invaluable. Certain instruments of state power will be most appropriate to preventing VNSA genesis (by addressing root causes and disrupting the connection between the international ecology and transformative processes). Others will be most effective at slowing or shaping VNSA growth once genesis has already occurred. Still others will be most effective at disrupting mature VNSA, using the principles of war and the strategy and tactics implied by them. Some instruments of state power will be most effective at encouraging the transformation of VNSA into non-violent actors (be that by co-optation, negotiated settlement, or destruction). Understanding the synergetic relationships between actions that intervene upon the system earlier and the effects produced later is admittedly hard, but not without potential.

The importance of leveraging multiple instruments of state power (including soft power) should be obvious. A “military only” response to the VNSA problem would hamstring our strategy. Numerous instruments of state power (ranging from economic aid to transnational education reform to conflict resolution to alternate identity cultivation to targeted special operations to international police cooperation to more traditional military force-on-force confrontations), applied at the right time at the right level in the right dimension, will have maximal impact. A strategy driven primarily by output considerations, either force-on-force or security-style confrontations of existing VNSA, lacks balance. To address the system only at the level of output, or by confronting only one aspect of the multiple functions, is to unnecessarily limit the full range of options we have for confronting VNSA. Too often, our strategies focus on direct effects against the organization without understanding how environmental shaping can indirectly impact performance. To ensure we consider the full range of policy options available for confronting VNSA, we offer the following list of bullets. None (of course) are “magic” bullets, but taken together, we think they provide coherent and workable ideas for US strategy:

Systems thinking offers a powerful approach to solving complex problems. Countering VNSA requires an approach that can effectively deal with high levels of uncertainty (rapidly changing environment and complex array of ever-changing factors). Systems thinking provides the intellectual scaffolding and tools for evaluating and acting on two sets of linkages: (1) relations between the organization and the battlespace; and (2) relations among the internal workings, or functions, of the organization. As an approach, it captures the adaptive, evolving character of all social organizations, providing insight to the exchange of information and resources with the

battlespace, the feedback loops that enable learning, and the leverage points that allow us to achieve lasting effects.

Our adversaries inhabit a niche in a multi-dimensional ecosystem. A critical insight for C-VNSA strategy is that webs of environments, interactions, and processes both contribute to and constitute VNSA growth. Those involved in formulating counterterrorism strategy need to be experts in these webs of structured interactive relationships. We could do worse than taking our cues from those who manage eco-systems such as foresters, farmers, and artificial life theorists. Or, as UCLA research fellow Raphael Sagarin maintains,

The real challenge is to apply evolutionary thinking to homeland security in a more structured, broad-based manner. Evolutionary biologists, ecologists, and paleontologists understand better than anyone the evolutionary successes and failures of genes and species and what it takes to survive in the natural world. Officials prosecuting the war on terrorism should bring experts on evolution into the discussion.⁷⁵

The members of the military profession involved in combating VNSA should, at the end of the day, be part of a transformed cadre of military professionals, possessing a very different set of skills not traditionally associated with the warrior profession: this is not our grandfather's security environment. Ecology, rather than physics, might be the operative structuring metaphor. An ecological approach might include actions intended to deny the VNSA access to its niche (physical sanctuary, cyber position, or idea space), interrupt resource intake, narrow advantages, or even to reposition ourselves into a sector that the VNSA previously inhabited without interference.

Effects-based analysis and operations sharpen focus on outcomes. Countering VNSA is an operational process focused on achieving specific mission outcomes, or effects. An effects-based approach views the adversary as a complex system and time as an

essential ingredient to analysis and operations. Direct and indirect effects cascade and accumulate to impact organizational capabilities and courses of action. Thinking in terms of effects ensures we remain centered on our goals while considering that changing circumstances and actions can ripple through the battlespace and organizations in it to alter conditions, constrain options, and shape capabilities. As opposed to a target or capabilities-based approach, which measure success in terms of destroying things or denying actions, effects-based operations incorporate them both as intermediary stops on the path to achieving a desired end-state.

Levels, dimensions, and time provide a three-dimensional skeleton for diagnosing and affecting VNSA. Effects are achieved within levels and dimensions over time. The three levels of analysis and action—strategic, operational, and tactical—are nested; effects, characteristics, and actions have a cascading impact on the adjoining level(s). Tactical-level actions are molded by operational constraints, but often have strategic consequences. Effects are also achieved and experienced across the physical, information, and social dimensions of the battlespace. Dimensions carve up the battlespace into mutually reinforcing, interrelated arenas, which are reassembled to build holistic battlespace awareness. By adding the time component we turn a static snap-shot into a dynamic motion picture.

Counter-VNSA missions are wide-ranging and multi-faceted. Confrontation happens in many ways. There are multiple paths towards successful confrontation with VNSA and the environments that generate them. We should not think of the war on terrorism as consisting only in armed struggle. Rather, aspects of this war may be more like the “war” on illiteracy—war-like in the sense that we take (or ought to take) the root causes of illiteracy very seriously and struggle

mightily against them, but not war-like in the sense that we shoot bullets at people who can't read. Effective use of the multiple instruments of state power is not to shrink from confrontation, nor to handle VNSA with kid gloves; rather, it is to boost our ability to successfully shape the battlespace in a maximally efficacious manner. The military is part of a coordinated interagency process that emphasizes public diplomacy, conflict resolution, and good governance. It provides lethal and non-lethal options for shaping battlespace conditions, strengthening allied CT capabilities, disrupting militarily accessible terrorist activities, and defeating organizations when and where they can be directly engaged. The great diversity of missions, which span the spectrum of conflict from combat to humanitarian operations, requires intelligence to address a wider array of conditions, threats, and stakeholders.

Countering VNSA involves non-traditional stakeholders with asymmetric capabilities and intentions. Religious leaders, local politicians, non-governmental organizations, international organizations, multi-national corporations, allied forces, and John Q. Public are often part of the mix. Getting a fix on who matters and why demands persistent stakeholder analysis, resulting in a crowded web of influence that can be leveraged, manipulated, isolated, and strengthened. We must account for all the stakeholders with potential influence and evaluate their capabilities and intentions as time and resources allow. In many cases, such as foreign internal defense or civil affairs, other stakeholders may be more important to mission success than the VNSA itself. Moreover, contemporary VNSA employ asymmetric tools and tactics and in some cases, values, to obtain surprise or exploit perceived weaknesses in the joint force.

VNSA are not monolithic, nor do they exist in splendid isolation. VNSA do not spring onto the international scene fully formed and made of solid granite. They develop over time, and as they do so, they articulate parts that have functions. VNSA are (thankfully) neither *hermetically* nor *hermeneutically* sealed. They exist as part of an open system and the parts of a VNSA are constantly exchanging matter and energy with the environment; more, the meanings VNSA leadership use to reinforce group and role-specific identity are not water-tight. Undermine a VNSA's "story," and you go a long way toward winning the hermeneutic struggle. *Stories open the book on VNSA group identity and strategy.* Stakeholder narratives are echoed in rhetoric, publications, recruiting and socialization processes, and operational actions. Analyzing narratives answers key questions, including issues of identity, cultural roots, ideological influences, sense of history, and the meaning of existence. The stories we tell connect our actions to a symbolic framework and a narrative thread that arcs through history. The more compelling narrative often wins, particularly when the struggle is between competing interpretations of contemporary events. By analyzing the stories told and enacted by our adversaries we answer key questions and gain insight to how it shapes the battlespace, other stakeholders, and the terrorist group itself.

Non-traditional intelligence that emphasizes social and cognitive capabilities is critical. Doing this all well is an intelligence-intensive enterprise. Much of our intelligence, especially military intelligence, is geared towards conventional warfare. Social intelligence is vital to a decision-quality understanding of the battlespace and adversary. Terrorist VNSA in particular are generally rooted in an ideology that reflects the human perceptions, socio-economic and political conditions, and culture of at least the group's

members if not the community from which it is spawned. Therefore, there is a pressing need to build the concepts and competencies that allow us to analyze social dynamics in a manner that gets beyond folklore. To that end, cultural intelligence as operationalized here provides for dealing with our own mirror-imaging and perceptual biases as well as for integrating consideration of perception and demographic effects, affordance theory (perception drives action), and the worldview of adversaries as reflected in their prevailing narratives. Much of this intelligence will be open-source, but will be manpower intensive and require a rich conceptual infrastructure in order to organize effectively. Actionable intelligence needs to be placed in boxes that bear a clear connection to policy and strategy; open-systems theory does some of this work for us.

Recurring, critical self-evaluation, if ignored, risks success. It is a mistake to think only in terms of the adversary. Understanding the decisionmaking process of the enemy is an enduring, yet highly elusive intelligence requirement. It is never possible when we fail to think through our own strengths and weaknesses; failing to do so ignores an essential aspect of the adversary's decision cycle. Even when we are not concerned with the perception of other stakeholders, our operational planning, force protection, and other inter-agency activities are improved by an understanding of our own critical factors and what the battlespace affords.

We don't mean to imply that none of these points are factored in to our current national security posture; on the contrary, seeds of them can be found scattered throughout our national security apparatus. Rather, our contention is that (in the main), we have *tended* toward output confrontations, ignored deterrent options, undervalued ecological insights, treated VNSA monolithically and without due regard to their

meaning-laden nature, defaulted to a narrow sense of confrontation rather than a broad sense, and not focused effectively on the appropriate intelligence tools. Moreover, our expertise is centered on specific groups, thus demanding a policy so nuanced that it lacks the cohesion required to synchronize the instruments of power. This is understandable, given the lack of a comprehensive framework for thinking about such organizations. If we are to overcome some of our disappointments with the results obtained thus far in our war on terror, though, we would do well to embrace the outlook presented here.

PARTING SHOTS

Not all the effects are important all of the time, but effects are present every time. The concept of effects, originating in the environment and shaping stakeholder performance, is peeled back here. Direct effects grab our attention with their in-your-face immediacy and impact, while indirect effects are often overlooked due to their subtle wear-you-down approach. Effects are only important insofar as they condition options and organizational performance. Therefore, we provided an inter-disciplinary approach to assessing total battlespace effects. Degrees of uncertainty, measured by change and complexity, shape decisionmaking styles, organizational structures, and planning. Nesting highlights the vertical and horizontal axes of effects. Tactical effects, like rules of engagement, can have strategic consequences when violated. The interrelationships among stakeholders present a web of influence that we must navigate. Reversing directions, the view from the organization's window reveals dependencies on critical and scarce resources, constraining action and exposing vulnerabilities. The battlespace also affords real advantages and disadvantages that may be misconstrued due to a lack of creativity or flawed perception. Complementing these overall effects are new concepts and methods for

Thomas and Casebeer—Turbulent Arena

the information and social dimensions. The information front fosters organizational, media, and cognitive effects. On the social front, demographics, culture, and perceptions shape options. Taken together, total and dimensional effects enable an initial cut at the comparative advantages or disadvantages we can expect relative to the VNSA and offer insight to entry point for influencing VNSA performance.

The philosopher and sociologist of science Thomas Kuhn is famous for articulating the idea of a paradigm shift.⁷⁶ Kuhn postulated that all science is conducted within the boundaries of a paradigm: fundamental assumptions about what we should count as real and how we come to possess knowledge about those things. From paradigms fall such items as testing procedures, methodological considerations, and vocabularies. Eventually, paradigms may enter a crisis stage because of their inability to resolve anomalies. For instance, the Newtonian paradigm eventually entered crisis because of its inability to explain multiple stellar phenomena, including the precession of Mercury. When a new paradigm emerges that explains away the anomalies that the paradigm in crisis could not, is it oft-times adopted, becoming the new and normal way of doing science. Progress occurs by the successive replacement of failing paradigms with more expansive explanatorily fecund paradigms.⁷⁷

Current approaches to VNSA understanding have multiple anomalies. Defense decision-makers have complained that we have no comprehensive understanding of terrorism as a phenomena; we have no way of knowing whether or not we are winning the war on it; ultimately, critics say, we are on unsure ground as we confront what could eventually become an existential challenge to our way of life. The way we best solve these anomalies and deal with the complexity before us, is by shifting to a more comprehensive framework that gives

us the tools, methods, and vocabulary we need to be able to make sense of them. That new paradigm is the one we have articulated here: the open systems framework can unify disparate approaches to VNSA, providing us comprehensive insight into how we can both effectively confront them across their entire life-cycle and measure whether or not our confrontation is effective. There is much at stake. The success of our national security posture rides on whether or not we are willing to think creatively and “outside of the box” about violent non-state actors. Nothing less is acceptable if we are to successfully confront a dynamic and growing threat to international security.

NOTES

¹ For a discussion of the Basque region, which includes insight to ETA’s development, we recommend Mark Kurlansky’s *The Basque History of the World*, (New York: Penguin Books, 1999). Insights for this vignette were also derived from the author’s visit to the Basque province in December 2003, which involved informal discussions with members of the ruling Basque Nationalist Party as well as leaders of several non-governmental social organizations pursuing non-violent solutions to the Basque conflict.

² An audio-tape attributed to Osama bin Laden surfaced in February 2003 in which the speaker stated, “We have been following anxiously the preparations of the crusaders to conquer the former capital of Islam and steal their wealth and impose a puppet regime that follows its masters in Washington and Tel Aviv.... We also want to clarify that whoever helps America...either if they fight next to them or give them support in any form or shape, even by words, if they help them to kill the Muslims in Iraq, they have to know that they are outside the Islamic nation,” and thus subject to punishment. Transcript reprinted in Daniel Benjamin and Steve Simon, *The Age of Sacred Terror: Radical Islam’s War Against America* (New York: Random House, 2003), 459-460. According to Lieutenant General David Barno in a February 2004 interview with the BBC, “Where our units interact with the same elders, the same leaders on a regular basis, our intelligence will improve dramatically, and we’ve seen indications of that in the last two months,” including the seizure of weapons caches or stores. Andrew North, “Village Life Benefits US Troops,” BBC News Online, 20 February 2004, URL: http://news.bbc.co.uk/2/hi/south_asia/3507141.stm, accessed on 16 May 2004.

³ Collective violence is an extension of collective action, which is coordinated action by the members of the group in pursuit of common ends. Charles Tilly, *From Mobilization to Revolution* (New York, NY: Random House, 1978), 55. See also Ted Robert Gurr, *Why Men Rebel* (Princeton, NJ: Princeton University Press, 1970).

⁴ Richard L. Daft, *Organization Theory and Design* (Mason, OH: Thomson South-western, 2004), 25-27.

⁵ For a primer on diagnosis, refer to Michael I. Harrison, *Diagnosing Organizations: Methods, Models, and Processes* (Thousand Oaks, CA: SAGE Publications, Inc., 1994).

⁶ Daft, 10.

⁷ Harrison, 39.

⁸ Thomas G. Cummings, quoting von Bertalanffy in *Systems Theory for Organization Development* (New York, NY: John Wiley and Sons, 1980), 6.

⁹ Daft, 14.

¹⁰ Daniel Katz and Robert I. Kahn, "Organizations and the System Concept," *The Social Psychology of Organizations* (New York, NY: John Wiley and Sons, 1966). Reprinted in *Classics of Organization Theory*, Jay M. Shafritz and J. Steven Ott, eds. (Fort Worth, TX: Harcourt College Publishers, 2001), 259.

¹¹ Daft, 14.

¹² Michael I. Harrison and Arie Shirom, *Organizational Diagnosis and Assessment: Bridging Theory and Practice* (Thousand Oaks, CA: Sage Publications, 1999), 44.

¹³ Katz and Kahn, 262.

¹⁴ Daft, 15.

¹⁵ Harrison and Shirom, 47-48.

¹⁶ Joint Pub 1-02, under " Battlespace."

¹⁷ Quoted from Field Manual 101-5-1/MCRP 5-2A, *Operational Terms and Graphics* (Washington, DC: Department of the Army and U.S. Marine Corps, 30 September 1997) in Medby, 16.

¹⁸ AFPAM 14-118, 17.

¹⁹ Joint Pub 2-01.3, II-37.

²⁰ Dimensions and sectors have enjoyed prominence in political and organizational theory for many years. In organizational theory, the

following sectors are identified: industry, raw materials, human resources, financial resources, markets, technology, economic conditions, government, socio-cultural, and international. See Daft, 137.

²¹ Joint Pub 2-01.3, II-10.

²² AFPAM 14-118, Attachment 4, “Aerospace Intelligence Preparation of the Battlespace for Information Operations,” 130-146.

²³ Edward Waltz, *Knowledge Management in the Intelligence Enterprise* (Boston: Artech House, 2003), 62.

²⁴ Waltz, 62.

²⁵ Bruce Berkowitz, *The New Face of War: How War will be Fought in the 21st Century* (New York: The Free Press, 2003), 2.

²⁶ This is a reference to the so-called OODA Loop of former Air Force officer John Boyd: Orient, Observe, Decide, Act. See Robert Corum, *Boyd: The Fighter Pilot who Changed the Art of War* (Boston: Little, Brown and Company, 2002).

²⁷ For a discussion of “failures in governance” as a key to the formation of violent non-state actors, see Troy S. Thomas and Stephen D. Kiser, *Lords of the Silk Route: Violent Non-State Actors in Central Asia*, Occasional Paper 43 (USAF Academy, CO: Institute for National Security Studies, May 2002), 45-47. For further insight to state failure, see Chester Cocker, “Why Failing States Endanger America,” *Foreign Affairs*, September-October 2003, 32-45, Donald Snow, *Uncivil Wars: International Security and the New Internal Conflicts* (Boulder, CO: Lynne Rienner Publishers, 1996), and reporting by the State Failure Task Force, University of Maryland, URL: <http://www.cidcm.umd.edu/inscr/stfail>.

²⁸ Of note, the USMC has engaged in an on-going cultural intelligence effort through its Center for Emerging Threats and Opportunities at the Marine Corps Warfighting Lab. More information can be found at <http://www.ceto.quantico.usmc.mil/projects.asp>.

²⁹ Troy S. Thomas and William D. Casebeer, *Violent Systems: Defeating Terrorists, Insurgents, and Other Non-State Adversaries*, Occasional Paper 52 (USAF Academy, CO: Institute for National Security Studies, March 2004), 32, quoting from Daniel Katz and Robert L. Kahn, *The Social Psychology of Organizations* (New York: John Wiley & Sons, 1978), 385.

³⁰ Katz, 386.

³¹ Katz, 385.

³² Katz, 388.

³³ Thomas G. Cummings and Christopher G. Worley, *Organization Development and Change* (Cincinnati, OH: South Western College Publishing, 1997), 480.

³⁴ According to terrorism expert Rohan Gunaratna, as of 2003 Al-Qaida's "banking network operates feeder and operational accounts, transfers from the feeder accounts to the operational accounts usually taking place through several bank accounts in order to disguise their true purpose.... Al-Qaida also siphons funds from legitimate Islamic charities and NGOs that it infiltrates, while its extensive web of front, cover and sympathetic organizations include businesses ranging from diamond-trading, import-export, manufacturing and transport. Al-Qaida's clandestine penetration of legitimate public and private organizations included one charity that became the unwitting target of such activities and whose board at the time included President Pervais Musharraf of Pakistan." *Inside Al-Qaida: Global Network of Terror* (New York: Colombia University Press, 2002), 62-63; Gunaratna, Associate Professor, Institute of Defence and Strategic Studies, Nanyang Technological University, interview by author, 24 February 2004, Sarajevo, Bosnia Herzegovina, and 19 March 2004, Montreal, Canada.

³⁵ JFCOM Glossary, under "Effects," URL: <http://www.jfcom.mil/about/glossary.htm#E>, accessed 14 May 2004.

³⁶ JFCOM Glossary, under "Effects-based Operations." For an analytical approach, see Paul K. Davis, *Effects-based Operations: A Grand Challenge for the Analytical Community* (Santa Monica, CA: RAND Corporation, 2001).

³⁷ JFCOM Glossary, under "direct effects."

³⁸ T.W. Beagle, "Effects-Based Targeting: Another Empty Promise," School of Advanced Airpower Studies thesis (Maxwell Air Force Base, AL: Air University Press, December 2001), 6.

³⁹ Dan Isaacs, "Nigeria's Firebrand Muslim Leaders," BBC News, 1 October 2001, URL: <http://news.bbc.co.uk/2/hi/africa/1573491.stm>, accessed on 27 April 2004.

⁴⁰ Orlando de Guzman, "The Philippines' MILF Rebels," BBC News, 6 May 2003, URL: <http://news.bbc.co.uk/2/hi/asia-pacific/3003809.stm>, accessed on 27 April 2004.

⁴¹ The seminal work on the turbulent character of the contemporary international system is James N. Rosenau's, *Turbulence in World Politics* (Princeton, NJ: Princeton University Press, 1990).

⁴² Daft, 141.

⁴³ Daft, 142.

⁴⁴ Mary Jo Hatch, *Organization Theory: Modern, Symbolic and Postmodern Perspectives* (Oxford: Oxford University Press, 1997), 90.

⁴⁵ Hatch, 90.

⁴⁶ Daft, 149.

⁴⁷ Daft, 149. See also Tom Burns and G. M. Stalker, “Mechanistic and Organic Systems,” *The Management of Innovation* (Oxford: Oxford University Press, 1994). Reprinted in *Classics of Organization Theory*, eds. Jay M. Shafritz and J. Steven Ott (Fort Worth, TX: Harcourt College Publishers, 2001), 201-205.

⁴⁸ Air Force Doctrine Document (AFDD) 2, *Organization and Employment of Aerospace Power* (Maxwell AFB, AL: Air Force Doctrine Center, 17 February 2000), 3. Cited hereafter as AFDD 2.

⁴⁹ AFDD 2, 2.

⁵⁰ JFCOM Glossary, under “cascading effects.”

⁵¹ Once captured, the Muslim commander has several options, which differ according to the Islamic school of thought (*madhab*) followed by the commander. According to the Shafi'i *madhab*, the commander is allowed four options; execution, enslavement, or release with or without ransom.⁵¹ The Maliki *madhab* does not allow for gratuitous release; that is, without ransom, while the Hanafi *madhab* forbids release under any condition until the war is terminated.⁵¹ The controversy surrounding the treatment of captives springs from contradictions among *Qur'anic* verses and inconsistent practices by the prophet Mohammad, and points to the need to thoroughly understand the prevailing *madhab* of any potential adversary to discern expected actions.⁵¹ There is general consensus, however, that the commander is not authorized to force the enemy to embrace Islam. Indeed, the POW must be kept alive and ultimately released, unless the Muslim commander follows the Maliki *madhab*. See Troy Thomas, “Prisoners of War in Islam: A Legal Inquiry,” *The Muslim World* (January 1997), 47.

⁵² Islamic laws regarding international relations, known as *siyar*, have real implications for CT missions against Islamist extremists. There is urgency in understanding, for example, what *siyar* has to say about a POW, given the frequency of conflict in which participants invoke *jihad*, and the continued likelihood of American and allied warriors becoming POWs. The need is further accentuated by the reality of conflict involving groups like al-Qaida, the IMU, or Abu Sayyaf. War with non-state actors exists outside the body of contemporary international law—war is traditionally the circumstance of states, and international law is the law of states. Even if we extended the laws of war to non-state actors like Al-Qaida, they

reject the system on which these very laws are predicated. These groups as well as hostile Islamic states, however, are bound by the legal maxims associated with *jihad*, which entitles their adversaries, including the US, to certain expectations of conduct. Armed with this understanding, individual warriors can assert rights even where the jurisdiction of international law ends, and policymakers are better positioned to leverage international opinion against those who violate the same laws they claim to enforce.

⁵³ Hatch, 65.

⁵⁴ Cited in *Amal and the Shi'a: Struggle for the Soul of Lebanon*, by Augustus Richard Norton (Austin, TX: University of Texas Press, 1987), 168-169.

⁵⁵ A RAND Corporation study stresses the difficulty of collecting intelligence on external relations. Bonnie Cordes, Brian M. Jenkins, Konrad Kellen, *A Conceptual Framework for Analyzing Terrorist Groups*, (Santa Monica, CA: The RAND Corporation, June 1985).

⁵⁶ I.M. Jawahar and Gary L. McLaughlin, "Toward a Descriptive Stakeholder Theory: An Organizational Life Cycle Approach," *The Academy of Management Review* 26, no. 3 (July 2001). From ProQuest.

⁵⁷ Hatch, 79-80.

⁵⁸ Andrea Scarantino, "Affordances Explained," *Philosophy of Science* (December 2003), 950.

⁵⁹ Stephen Sloan, "The Changing Nature of Terrorism," *The Terrorism Threat and U.S. Government's Response: Operational and Organizational Factors*, eds. James Smith and William Thomas. (US Air Force Academy, CO: USAF Institute for National Security Studies, March 2001), 61-62.

⁶⁰ John Arquilla, David Ronfeldt, and Michele Zanini, "Networks, Netwar, and Information-age Terrorism," *Countering the New Terrorism*, eds. Ian O. Lesser and others (Santa Monica, CA: RAND Corporation, 1999), 65.

⁶¹ For a full discussion of each, I recommend Dorthy E. Denning, "Activism, Hacktivism, and Cyberterrorism: The Internet as a Tool for Influencing Foreign Policy," *Networks and Netwars*, eds. John Arquilla and David Ronfeldt (Santa Monica, CA: RAND Corporation, 2001), 239-288. For the overall best discussion of information-age effects, see Gregory J. Rattray, *Strategic Warfare in Cyberspace* (Cambridge, MA: MIT Press, 2001).

⁶² "Examining the Cyber Capabilities of Islamic Terrorist Groups," presentation by the Technical Analysis Group, Institute for Security Technology Studies, Dartmouth College, November 2003, slide 18. A good example of a bin Laden recruitment video can be found at the

Columbia International Affairs On-line website (ciao.net). Cited hereafter as “Cyber Capabilities.”

⁶³ Walter Laqueur, *The New Terrorism: Fanaticism and the Arms of Mass Destruction* (New York: Oxford University Press, 1999), 44.

⁶⁴ Hoffman, 147.

⁶⁵ Joints Chiefs of Staff, Joint Publication 3-61, *Doctrine for Public Affairs in Joint Operations* (Washington, DC: GPO, 14 May 1997), III-18.

⁶⁶ Bazerman, 5.

⁶⁷ Bazerman, 5.

⁶⁸ Medby, 57.

⁶⁹ “Irregular warfare exists in highly specific operational environments, ‘microclimates,’ which need to be understood by intelligence analysts, military commanders, and policymakers. This presents several challenges. First, these operational environments consist of a number of elements, including geography, ecology, history, ethnicity, religion, and politics. These are not topics to which the military intelligence community devotes much attention. Second, for irregular warfare, these have to be seen in a detailed and nuanced context. It is specific local geography, history, and politics that are crucial. Arab history is one thing, the history of Christian-Druze conflict in Lebanon is another, and the role of specific families and family members yet another. Collecting, analyzing, and assimilating information at this level of detail is a formidable challenge for intelligence analysts, policymakers, and warfighters alike.” Jeffrey B. White, “A Different Threat: Some Thoughts on Irregular Warfare,” *Studies in Intelligence* (Washington, DC: Center for the Study of Intelligence, 1996), 2.

⁷⁰ Thomas and Kiser, 24.

⁷¹ Thomas, 24.

⁷² Medby, 59.

⁷³ Thomas E. Ricks, “80% in Iraq Distrust Occupation Authority,” *Washington Post*, 13 May 2004, URL: <http://www.washingtonpost.com/ac2/wp-dyn/A22403-2004May12?language=printer>, accessed 25 May 2004.

⁷⁴ JFCOM Glossary, under “Cumulative Effects.”

⁷⁵ See his “Adapt or Die: What Charles Darwin can teach Tom Ridge about homeland security,” *Foreign Policy* (September/October 2003): 68-9.

⁷⁶ Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago, IL: The University of Chicago Press, 1962).

⁷⁷ For technical reasons regarding the incommensurability of vocabularies between paradigms, Kuhn is sometimes cast as a skeptic regarding the idea of scientific progress. We can set aside this concern for present purposes. Even if paradigms *are* problem-driven, and our problems *change* from epoch to epoch, it still remains the case that solving the VNSA problem is critical currently.